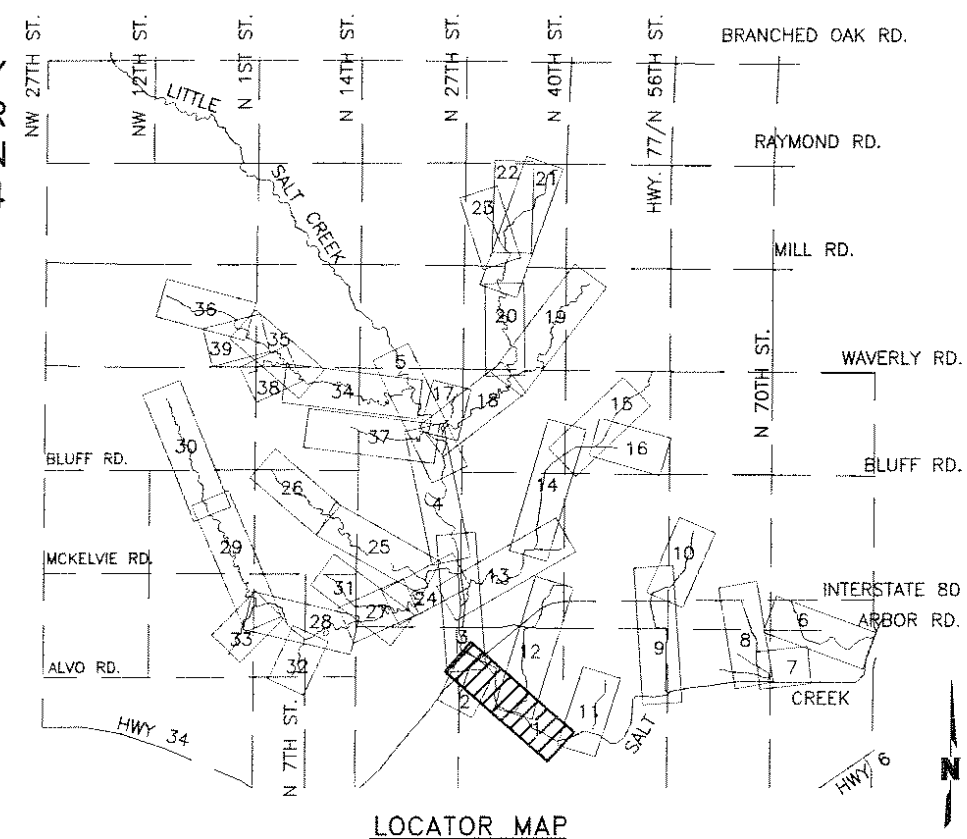


LOCATION OF ENVIRONMENTALLY
SENSITIVE WETLAND AND WATER
AREAS ARE SHOWN ON
FIGURES I-3 & I-4

- 2-YEAR
- 10-YEAR
- 100-YEAR
- 100-YEAR LITTLE SALT CREEK FIS
- 500-YEAR



LOCATOR MAP



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Lincoln, Nebraska

Plan View of Stream Segment 1

Interim Stormwater Hydrology and Hydraulics Report for Lower Little Salt Creek Watershed

FIGURE: I-12B



Photo 1: Looking downstream from Interstate 80.



Photo 2: Looking at the east channel bank.

Stream Segment 1 in Little Salt Creek

Evaluation

Stream Segment 1 begins at the confluence with Salt Creek near North 40th Street (extended). Interstate east- and west-bound lanes and the east-bound off-ramp cross the channel.

- Reach Stability

This reach shows signs of active streambed and bank erosion. The predominant factor causing this erosion is head cutting that is proceeding upstream from Salt Creek. The channel has incised 15 to 20 ft below its historic level based on evaluation of adjacent oxbows.
- Flood Hazard

Buildings constructed in the floodplain are a minimum of 1-ft above the base flood elevation.
- Infrastructure

Active channel bank sloughing can be observed along the whole segment. There is no immediate threat apparent to overhead or buried utilities. The roadway crossings at the Interstate exceed DCM requirements for overtopping (see the hydraulics section for more information on overtopping frequency).
- Water Quality

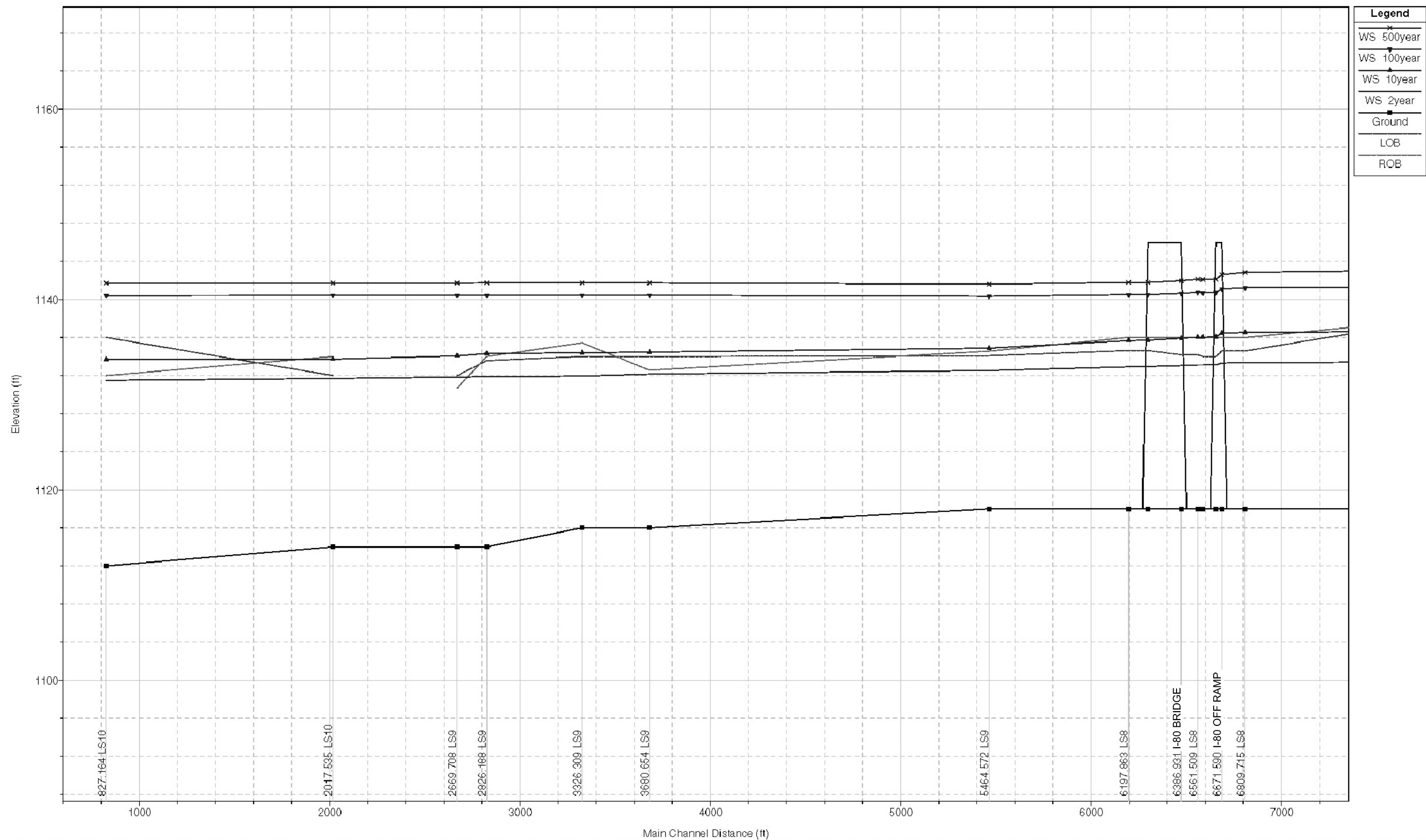
Runoff from adjacent commercial and upstream crop land is the dominant characteristic affecting surface water quality. The lower portion of the segment is wetland and commercial. The amount of natural riparian vegetation in the upper part of this segment has been reduced through stream modification and agricultural tillage to the top of stream banks. The runoff from the commercial development is directed around the saline wetlands via channels to Little Salt Creek.
- Land Use and Ownership

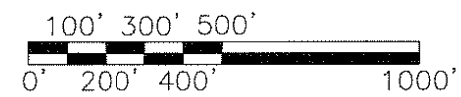
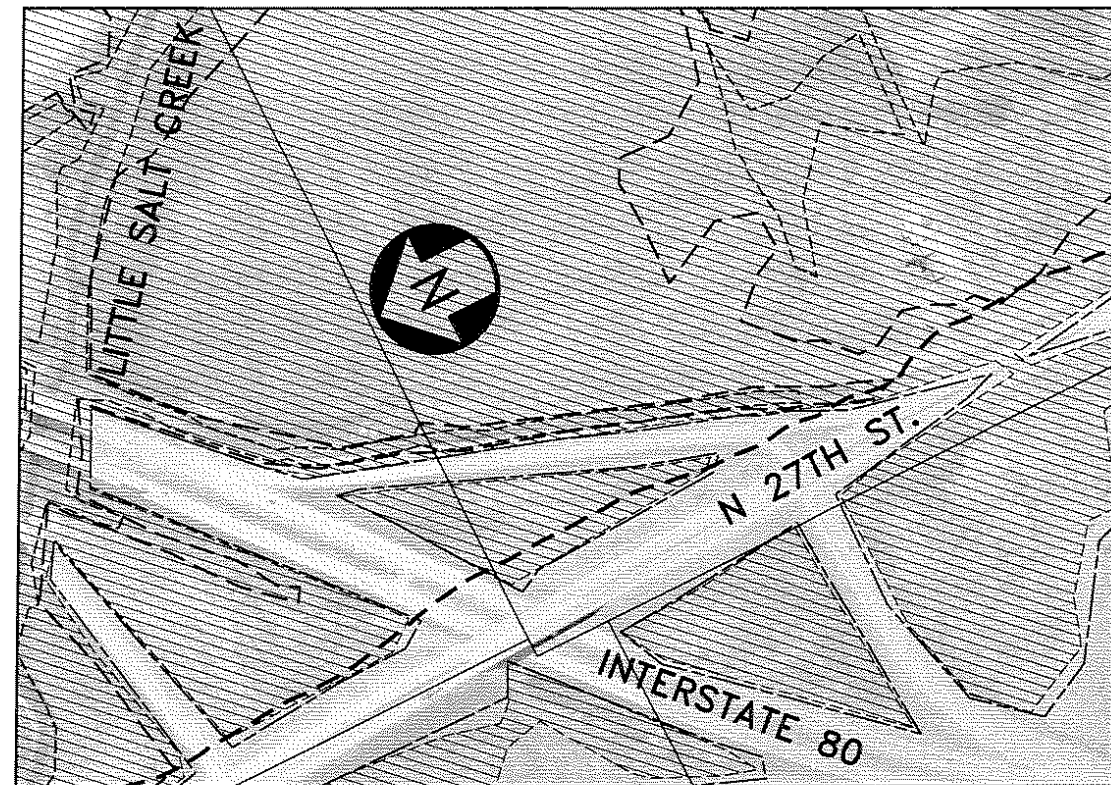
The land around this stream segment is privately held except for the Whitehead Wetlands, which is owned and operated by the LPSNRD. The land use is mixed commercial and agricultural. A portion of the area is projected for development by the LLCCP as commercial, and the remainder as environmental resources land uses.
- Multi-Purpose Use Potential

The multi-use potential of these stream corridors is limited by the sensitive environmental issues. These areas contain saline wetlands. Due to the presence of potential Salt Creek Tiger Beetle Habitat at the confluence with Salt Creek, some restrictions on land use will likely be developed. Based on the Mayor's Salt Creek Tiger Beetle Cabinet Report, it is likely that open spaces (buffer zones) will be created or maintained. These areas may be used as protected habitat areas or ecological study areas. Preservation of the existing floodplain storage volume would help mitigate the impact of projected development.

Threat Matrix

Issue	Degree of Threat		
	Low	Medium	High
Reach Stability			X
Flood Hazard Potential		X	
Infrastructure		X	
Water Quality	X		





LOCATION OF ENVIRONMENTALLY
SENSITIVE WETLAND AND WATER
AREAS ARE SHOWN ON
FIGURES 1-3 & 1-4

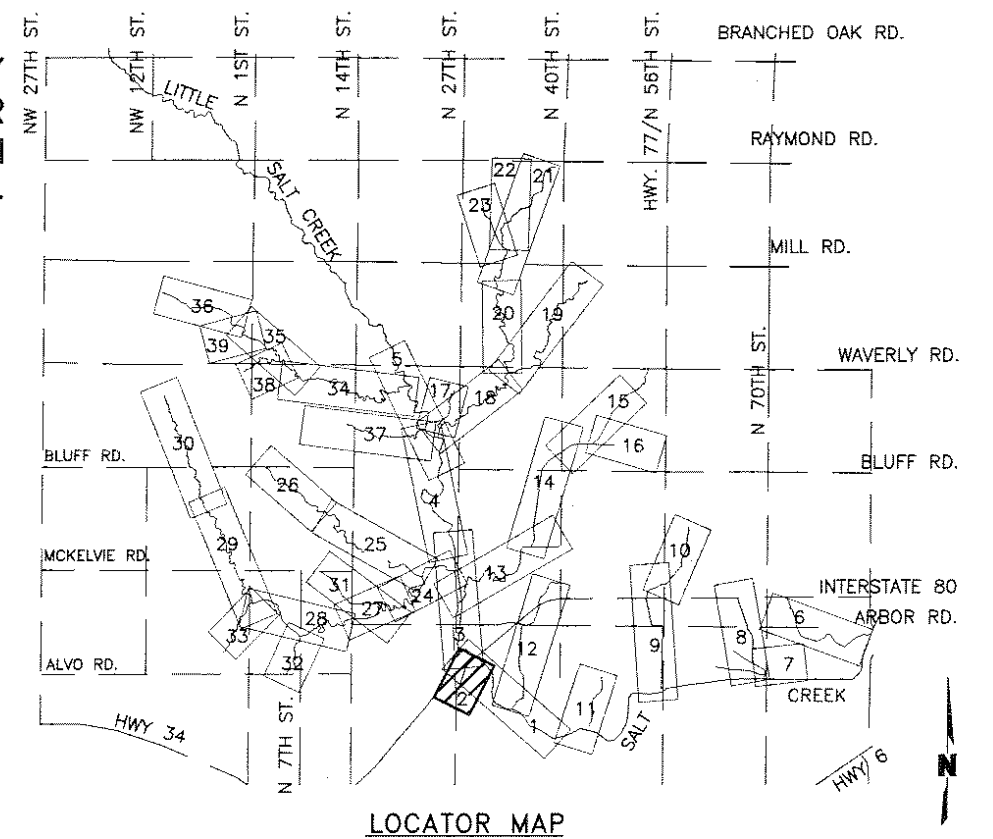
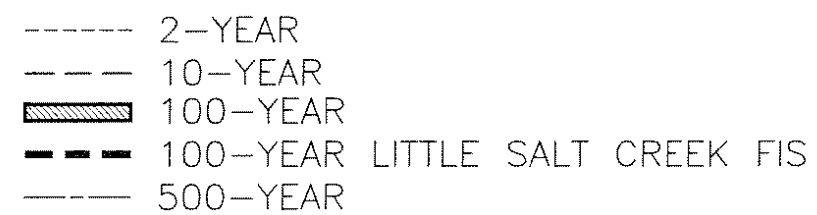




Photo 3: Looking west at fill.



Photo 4: Looking south at old oxbow.

Stream Segment 2 in Little Salt Creek

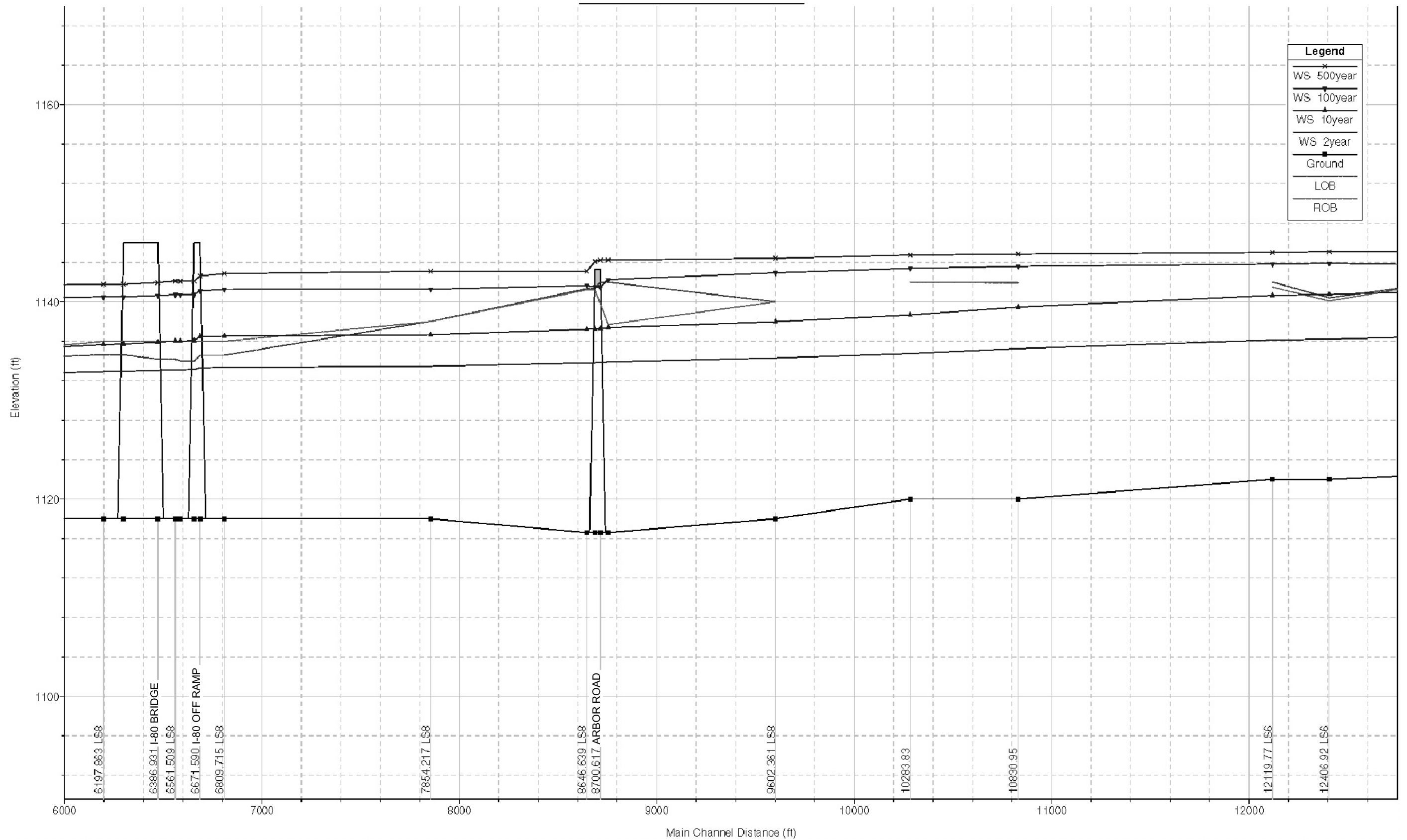
Evaluation

Stream Segment 2 begins at the south side of the Interstate 80 east-bound lane, and extends nearly to North 27th Street. The Whitehead Saline wetlands are located adjacent to the channel.

- Reach Stability This reach shows signs of active streambed and bank erosion. The predominant factor causing this erosion is head cutting that is proceeding upstream from Little Salt Creek.
- Flood Hazard The area is undergoing development into a commercial land use. The low opening in buildings are 1-ft above the base flood elevation.
- Infrastructure There is no immediate threat apparent to overhead or buried utilities. The roadways are elevated above the base flood elevation.
- Water Quality The runoff from the commercial development is directed around the saline wetlands via channels to Little Salt Creek.
- Land Use and Ownership The land around this stream segment is privately held except for the Whitehead Saline wetlands, which is owned and operated by the LPSNRD The land use is commercial and environmental resources.
- Multi-Purpose Use Potential These areas contain saline wetlands and may be used as protected habitat areas or ecological study areas. There are conservation easements intertwined amongst the commercial properties.

Threat Matrix

Issue	Degree of Threat		
	Low	Medium	High
Reach Stability			X
Flood Hazard Potential		X	
Infrastructure	X		
Water Quality	X		



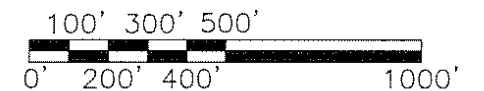
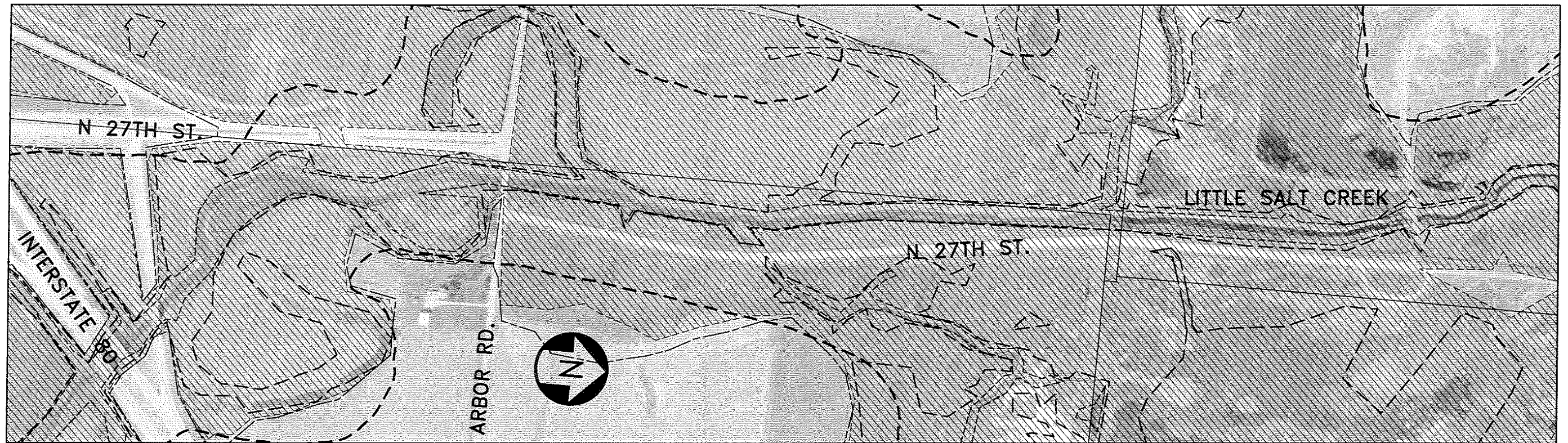
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Lincoln, NE 68508
1-402-474-6311

Lincoln, Nebraska

Stream Segment 2

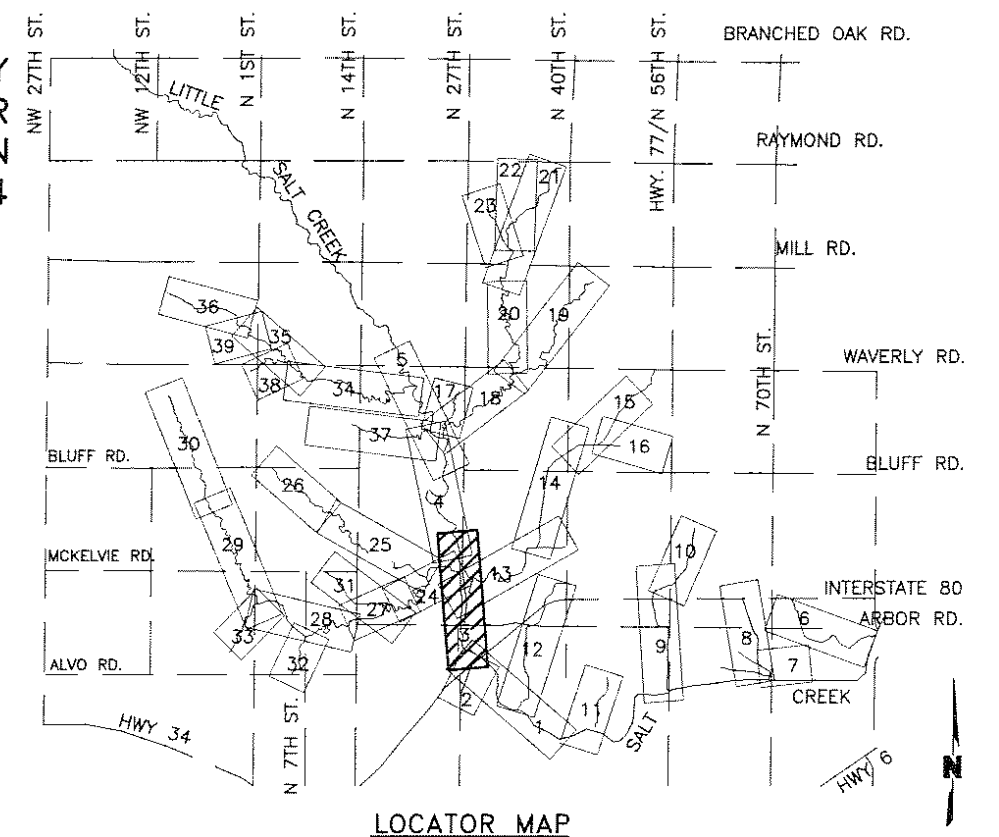
Interim Stormwater Hydrology and Hydraulics Report for Lower Little Salt Creek Watershed

FIGURE: I-13C



LOCATION OF ENVIRONMENTALLY
SENSITIVE WETLAND AND WATER
AREAS ARE SHOWN ON
FIGURES I-3 & I-4

- 2-YEAR
- 10-YEAR
- 100-YEAR
- 100-YEAR LITTLE SALT CREEK FIS
- 500-YEAR



LOCATOR MAP



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Lincoln, NE 68508
1-402-474-8311

Lincoln, Nebraska

Plan View of Stream Segment 3

Interim Stormwater Hydrology and Hydraulics Report for Lower Little Salt Creek Watershed

FIGURE: I-12D



Photo 5: Looking downstream from Arbor Road bridge.



Photo 6: Looking upstream from Arbor Road bridge.

Stream Segment 3 in Little Salt Creek

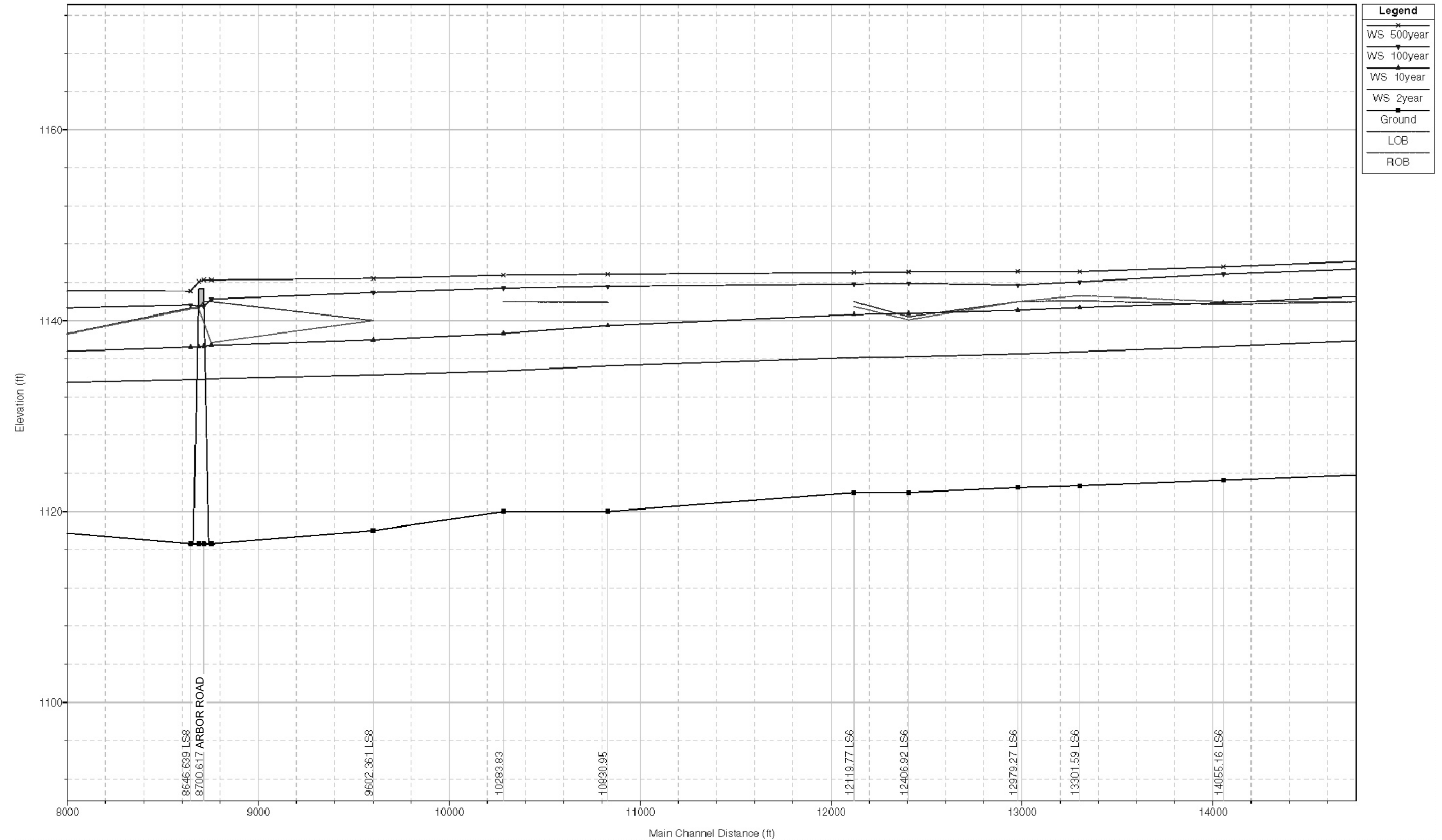
Evaluation

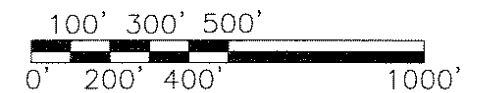
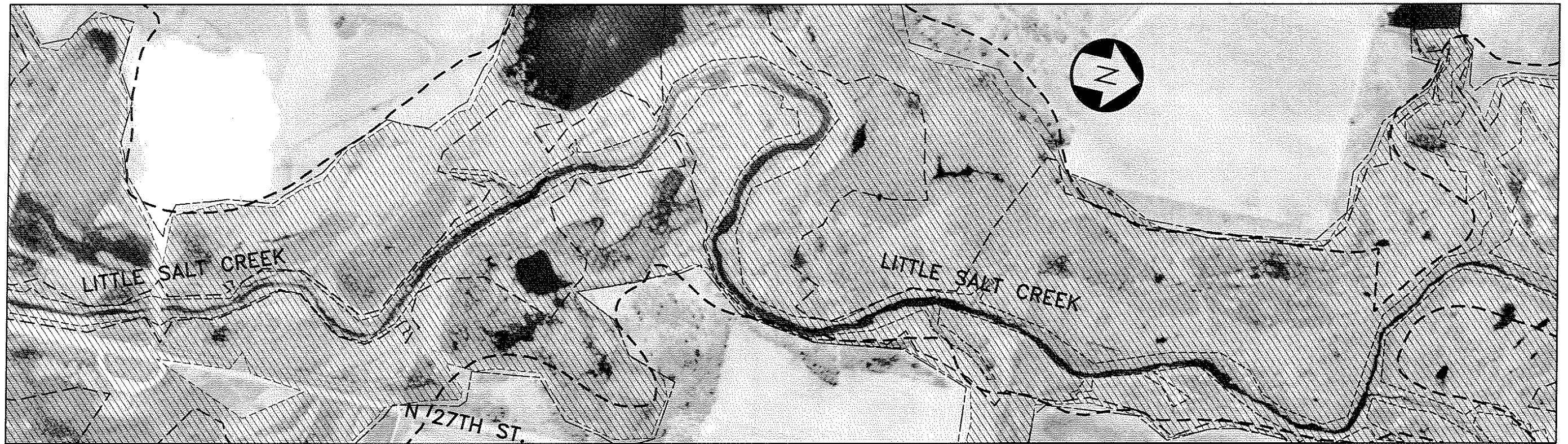
Stream Segment 3 begins upstream of the Interstate 80 off-ramp and extends parallel to North 27th Street to the Arbor Lake wetlands. Arbor Road and a private low-water driveway cross the channel. The United States Geologic Survey maintains a stream gage station at the Arbor Road bridge. The Arbor Lake wetlands are located adjacent to the channel. The tributaries from UPZ N-2 and UPZ N-4 discharge into the channel in this segment.

- Reach Stability This reach shows signs of active streambed and bank erosion. The predominant factor causing this erosion is head cutting that is proceeding upstream from Salt Creek.
- Flood Hazard Commodities, crops, pasture and wetlands along the channel are subject to flood hazard. No buildings appear to be within the limits of the 100-year floodplain.
- Infrastructure North 27th Street is parallel to the channel in this segment. Channel bank instability could threaten the roadway. There is no immediate threat apparent to overhead or buried utilities in this stream segment. The roadway crossing at Arbor Road meets DCM minimum requirements. (see the hydraulics section for more information on overtopping frequency.)
- Water Quality Runoff from adjacent and upstream crop land is the dominant characteristic affecting surface water quality. An earth borrow pit operated adjacent to this stream segment could be a sediment source if ESC BMP's are not properly implemented and maintained. The lower portion of the segment is grazed pasture. The amount of natural riparian vegetation in the upper part of this segment has been reduced through stream modification and agricultural tillage to the top of stream banks.
- Land Use and Ownership The land around this stream segment is privately held except for the Arbor Lake wetlands, which are owned by the City of Lincoln and managed by the Nebraska Game and Parks Commission. The land use is agricultural, with an industrial development currently in progress southwest of the intersection of North 27th Street and Arbor Road. The area is not projected for further development by the LLCCP.
- Multi-Purpose Use Potential These areas contain saline wetlands. Due to the presence of the potential Salt Creek Tiger Beetle habitat, some additional management practices for land use will likely be developed. Based on the Mayor's Salt Creek Tiger Beetle Cabinet Report and other subsequent studies, it is likely that buffer zones will be created or maintained to enhance protection of the species. These areas may be used as protected habitat areas or ecological study areas as well as various other appropriate uses. A direct connection with Salt Creek enhances the viability of this area as a wildlife and habitat corridor.

Threat Matrix

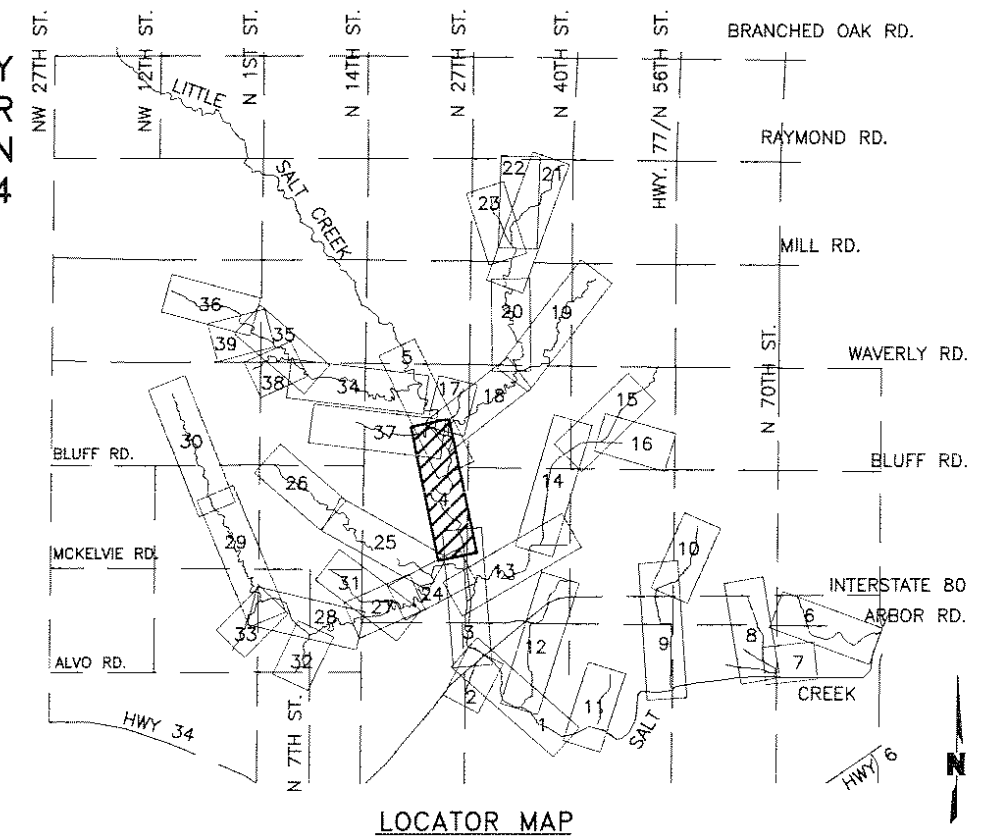
Issue	Degree of Threat		
	Low	Medium	High
Reach Stability			✗
Flood Hazard Potential	✗		
Infrastructure			✗
Water Quality	✗		





LOCATION OF ENVIRONMENTALLY SENSITIVE WETLAND AND WATER AREAS ARE SHOWN ON FIGURES I-3 & I-4

- 2-YEAR
- 10-YEAR
- ===== 100-YEAR
- 100-YEAR LITTLE SALT CREEK FIS
- 500-YEAR



LOCATOR MAP



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Lincoln, Nebraska

Plan View of Stream Segment 4

Interim Stormwater Hydrology and Hydraulics Report for Lower Little Salt Creek Watershed

FIGURE: I-12E



Photo 7: Looking upstream from private driveway.

Stream Segment 4 in Little Salt Creek

Evaluation

Stream Segment 4 begins near the Arbor Lake wetlands and extends nearly to Waverly Road. Saline soils and wetlands can be found flanking the channel along its entire length. The tributary from UPZ N-3 discharges into this reach.

- Reach Stability

This reach shows signs of active stream bed and bank erosion. Broken concrete riprap was placed along the west bank in an attempt to stabilize the toe. Unfortunately, doing so buried prime habitat for the Salt Creek Tiger Beetle.
- Flood Hazard

Commodity crops, pasture, and wetlands along the channel are subject to flood hazard. There are no buildings in or near the floodplain along this reach. No buildings appear to be near or within the limits of the 100-year floodplain.
- Infrastructure

There is no immediate threat apparent to overhead or buried utilities in the road Row. There are no roadway crossings in this stream segment.
- Water Quality

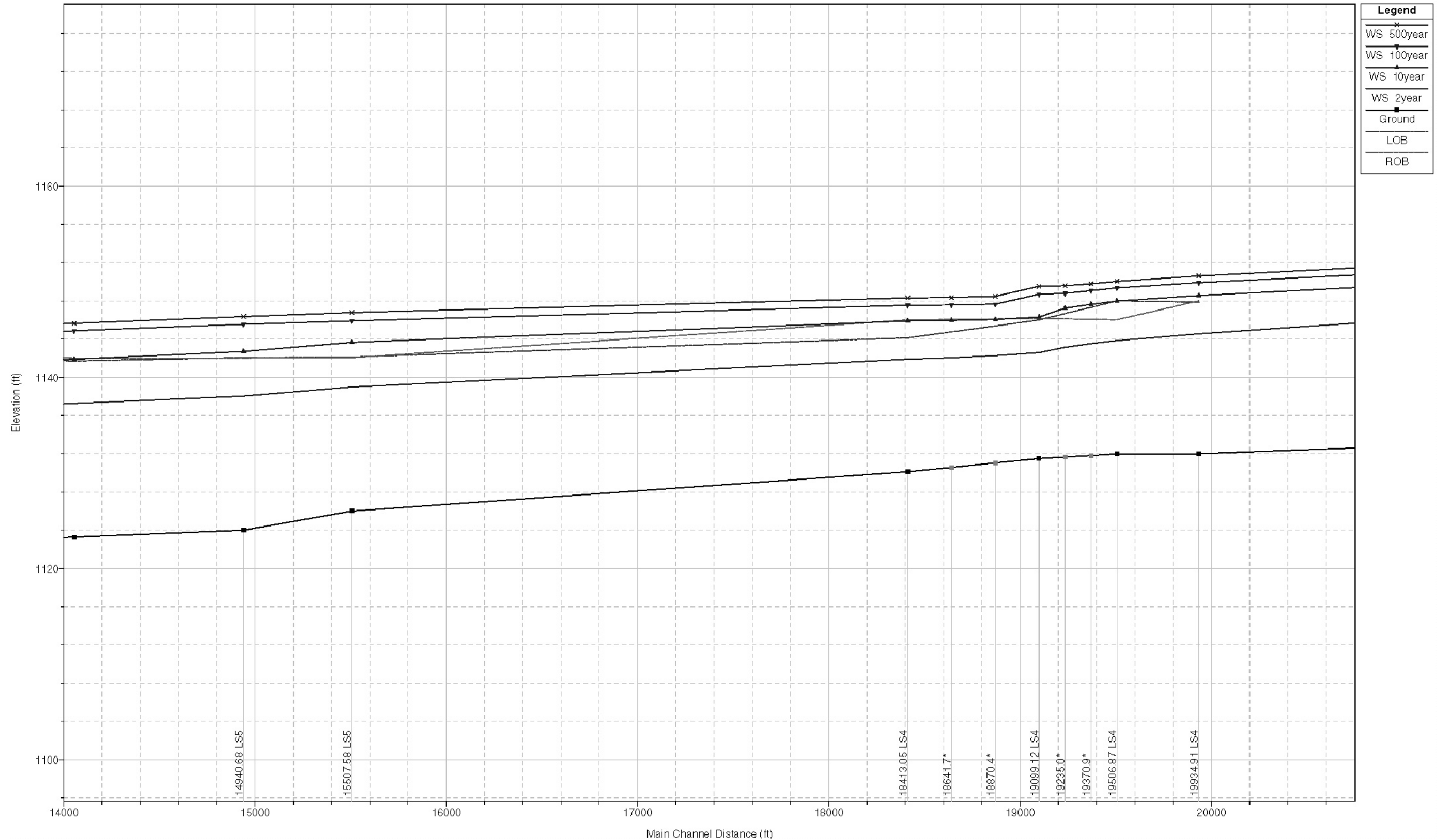
Runoff from adjacent and upstream crop land is the dominant characteristic affecting surface water quality. Riparian habitat has been preserved in this segment.
- Land Use and Ownership

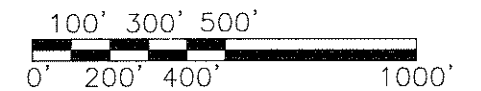
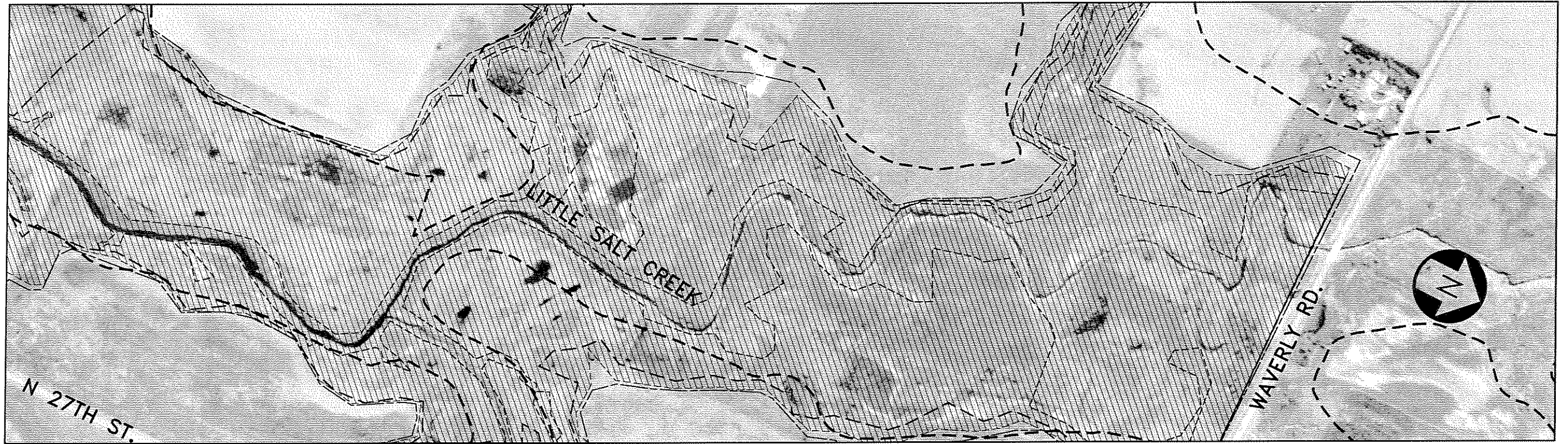
The land around this stream segment is privately held. The land use is agricultural pasture and the area is not projected for development by the LLCCP.
- Multi-Purpose Use Potential

Due to the presence of the potential Salt Creek Tiger Beetle habitat, some additional management practices for land use will likely be developed. Based on the Mayor's Salt Creek Tiger Beetle Cabinet Report and other subsequent studies, it is likely that buffer zones will be created or maintained to enhance protection of the species. These areas may be used as protected habitat areas or ecological study areas as well as various other appropriate uses. A direct connection with Salt Creek enhances the viability of this area as a wildlife and habitat corridor.

Threat Matrix

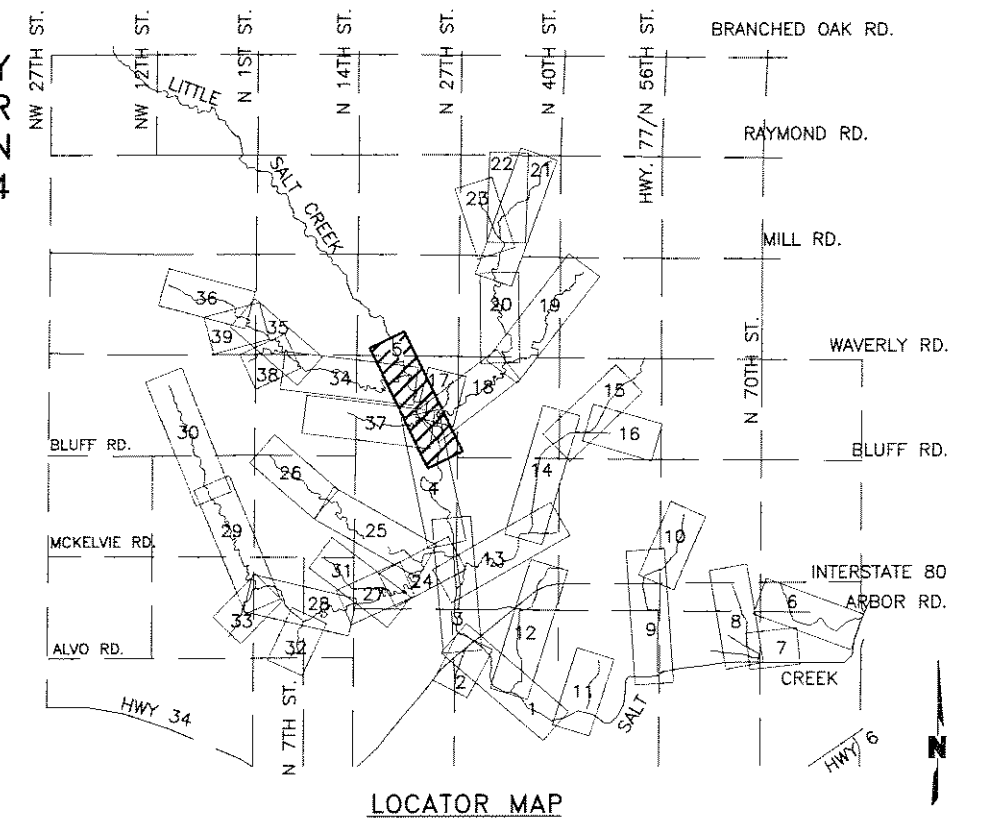
Issue	Degree of Threat		
	Low	Medium	High
Reach Stability			X
Flood Hazard Potential	X		
Infrastructure		X	
Water Quality	X		





LOCATION OF ENVIRONMENTALLY
SENSITIVE WETLAND AND WATER
AREAS ARE SHOWN ON
FIGURES I-3 & I-4

- 2-YEAR
- 10-YEAR
- 100-YEAR
- 100-YEAR LITTLE SALT CREEK FIS
- 500-YEAR



LOCATOR MAP



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1111 Lincoln Mall
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1-402-474-6311

Lincoln, Nebraska

Plan View of Stream Segment 5

Interim Stormwater Hydrology and Hydraulics Report for Lower Little Salt Creek Watershed

FIGURE: I-12F



Photo 8: Looking downstream from Waverly Road.

Stream Segment 5 in Little Salt Creek

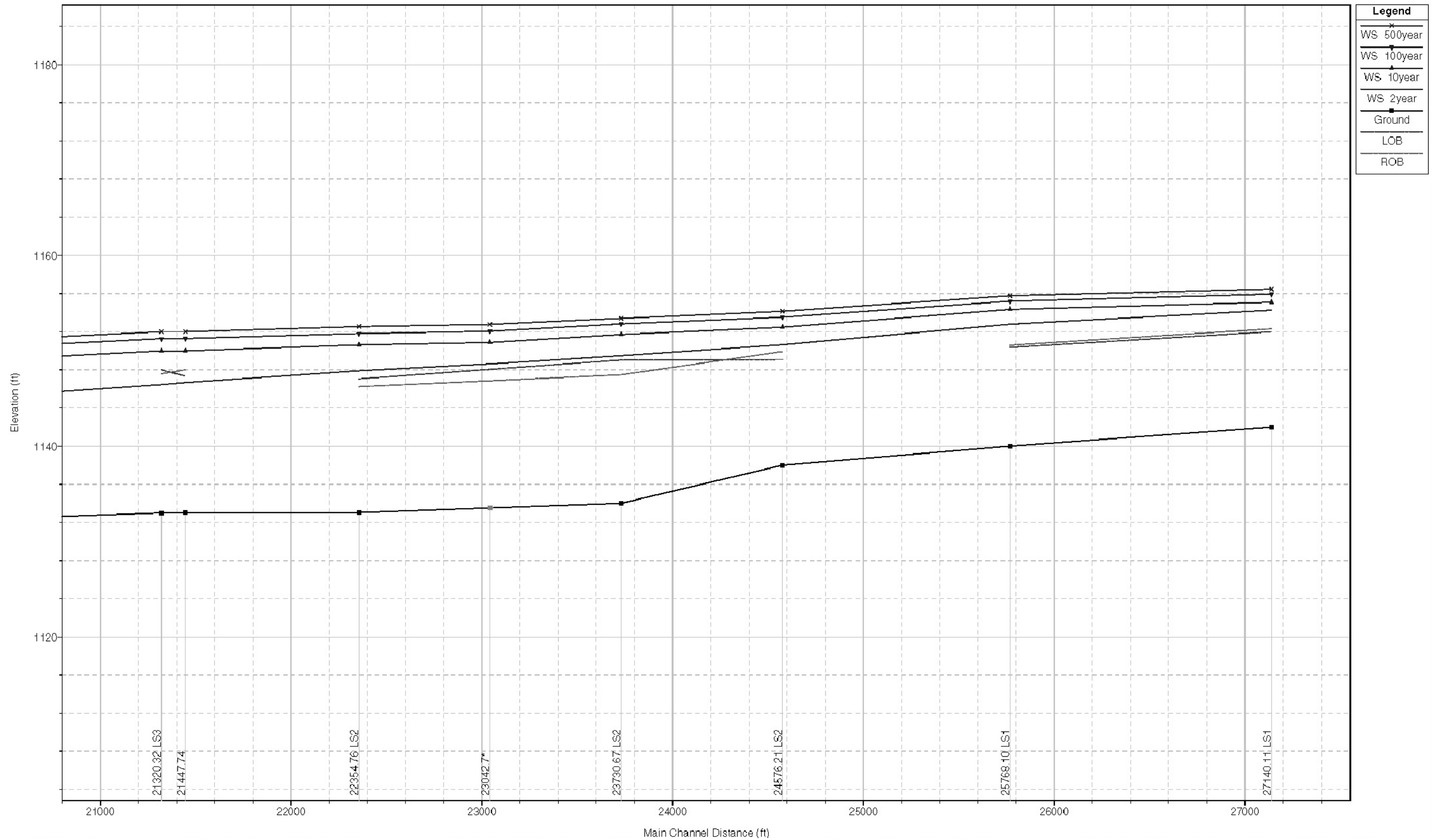
Evaluation

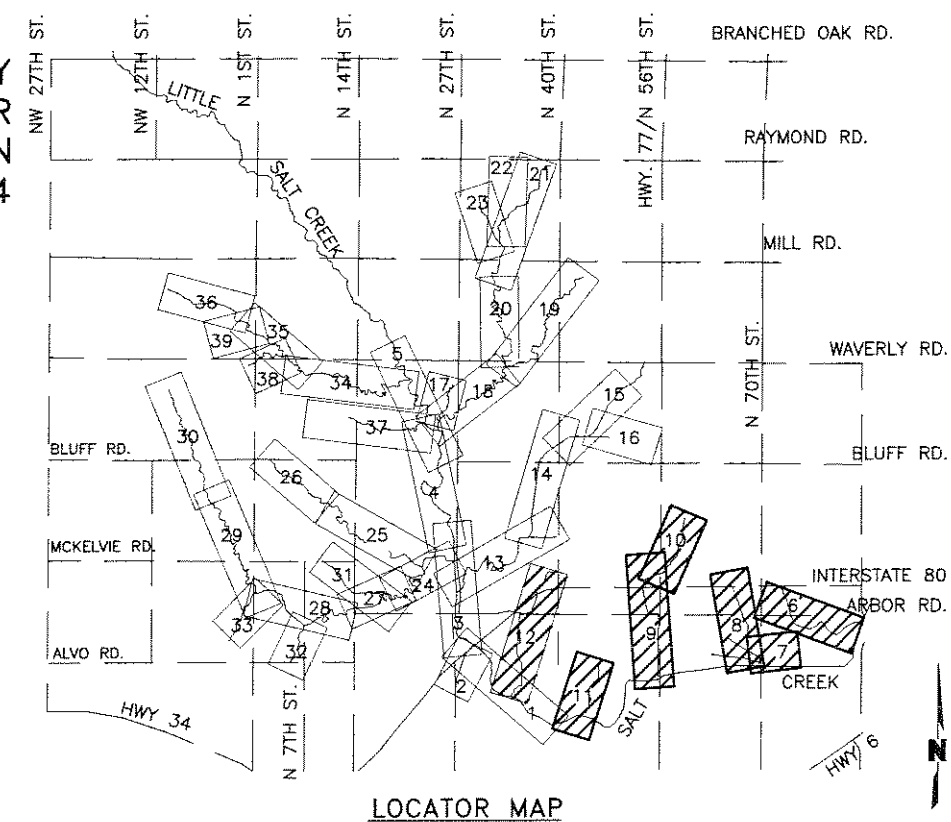
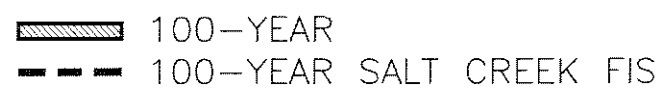
Stream Segment 5 begins at the confluence with N-3 and extends to Waverly Road. The tributary from UPZ N-5 discharges into this reach. The Little Salt Creek channel continues northerly into the Upper Little Salt Creek watershed.

- Reach Stability This reach shows few signs of active stream bed and bank erosion. The channel has a moderate degree of meanders.
- Flood Hazard Pasture and wetlands along the channel are subject to flood hazard. No buildings appear to be within the limits of the 100-year floodplain.
- Infrastructure There is no immediate threat apparent to overhead or buried utilities in this stream segment. There are no crossings over the channel in this segment.
- Water Quality Runoff from adjacent and upstream crop land is the dominant characteristic affecting surface water quality. This stream segment is grazed pasture.
- Land Use and Ownership The land around this stream segment is privately held. The land use is agricultural and the area is not projected for development by the LLCCP.
- Multi-Purpose Use Potential These areas contain saline wetlands and may be used as protected habitat areas or ecological study areas.

Threat Matrix

Issue	Degree of Threat		
	Low	Medium	High
Reach Stability		X	
Flood Hazard Potential	X		
Infrastructure	X		
Water Quality	X		





Stream Segment Evaluation

UPZ N-1 (Stream Segments 6 through 12)

Stream segments 6 through 12 drain subbasins that discharge directly into Salt Creek. The area is zoned for commercial and industrial development. This is the only Urban Planing Zone currently projected for further development.

Reach Stability

The lower portion of the mainstem is deeply incised, has been realigned and shows signs of ongoing active stream bed and bank erosion. The predominant factor causing this erosion is head cutting action that is proceeding upstream from Salt Creek.

Flood Hazard Potential

Commodity crops, pasture and wetlands along the channel are subject to flood hazard. No buildings appear to be within the limits of the 100-year floodplain.

Threats to Infrastructure

There is no immediate threat apparent to overhead or buried utilities in the road Row. The roadway crossings in this basin are listed below (see the hydraulics section for more information on overtopping frequency).

<u>Stream Segment</u>	<u>Road Crossing</u>	<u>Meets DCM Criteria?</u>
6	Arbor Road*	No
8	Arbor Road*	Yes
9	Arbor Road*	No
10	Interstate 80*	Yes
10	Highway 77/56th Street*	No
12	Arbor Road*	Yes
12	Interstate 80*	Yes
*on a tributary		

Roadways subject to frequent overtopping require more frequent maintenance.

Land Use and Ownership

The land around these stream segments is privately held except for the Arbor Lake wetlands, which are owned by the City of Lincoln and managed by the Nebraska Game and Parks Commission, and the Whitehead Saline wetlands, which are owned and managed by the LPSNRD. The land use is commercial south of Interstate 80, and agricultural north of the Interstate with an industrial development currently in progress southwest of the intersection of North 27th Street and Arbor Road. The agricultural land use area is not projected for further development by the LLCCP.

Multi-Purpose Use Potential

Due to the presence of potential Salt Creek Tiger Beetle habitat along Little Salt Creek, some form of restrictive land use will likely be implemented. Based on the Mayor's Salt Creek Tiger Beetle Cabinet Report, it is likely that open spaces (buffer zones) will be created or maintained. These areas may be used as protected habitat areas or ecological study areas. A continuous connection along Little Salt Creek enhances the viability as a wildlife and habitat corridor. Preservation of the existing floodplain storage volume would help mitigate the impact of projected development. Much of the area along the channel has saline soils and historically, most of the area not in wetlands has been used for pasture.

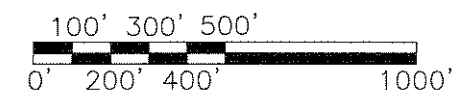
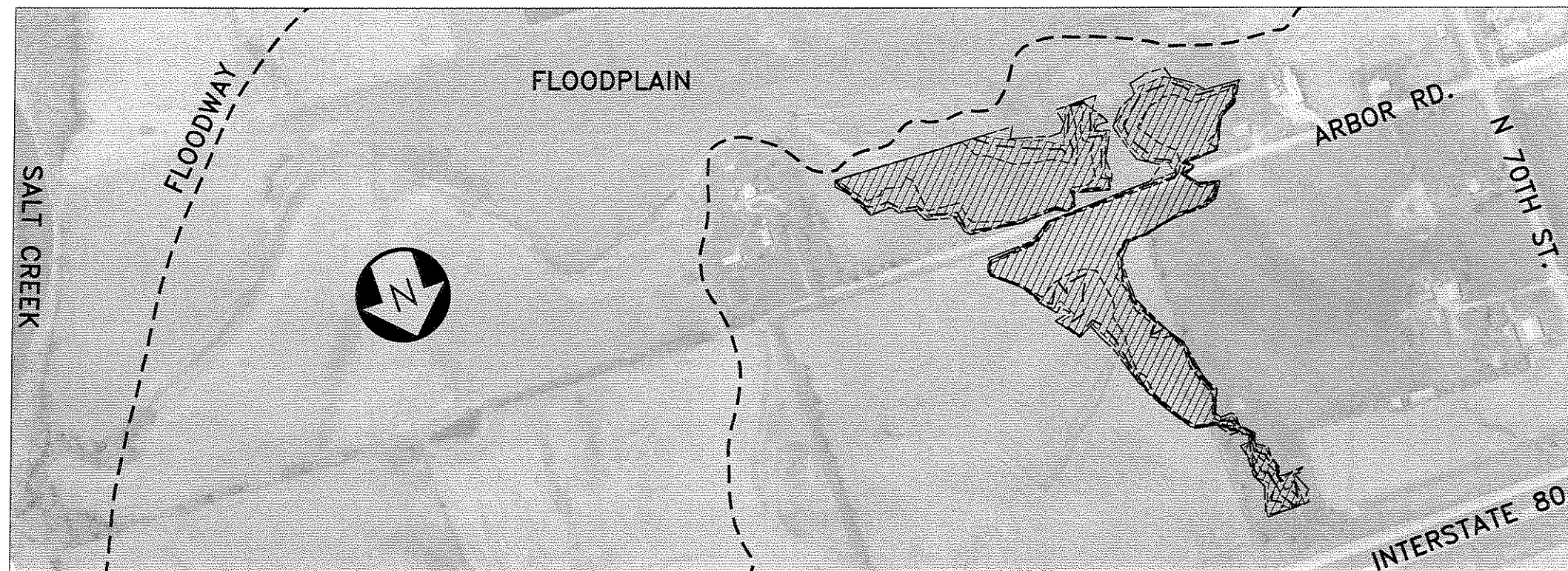
Water Quality

Runoff from adjacent and upstream crop land is the dominant characteristic affecting surface water quality.

Saline Wetlands

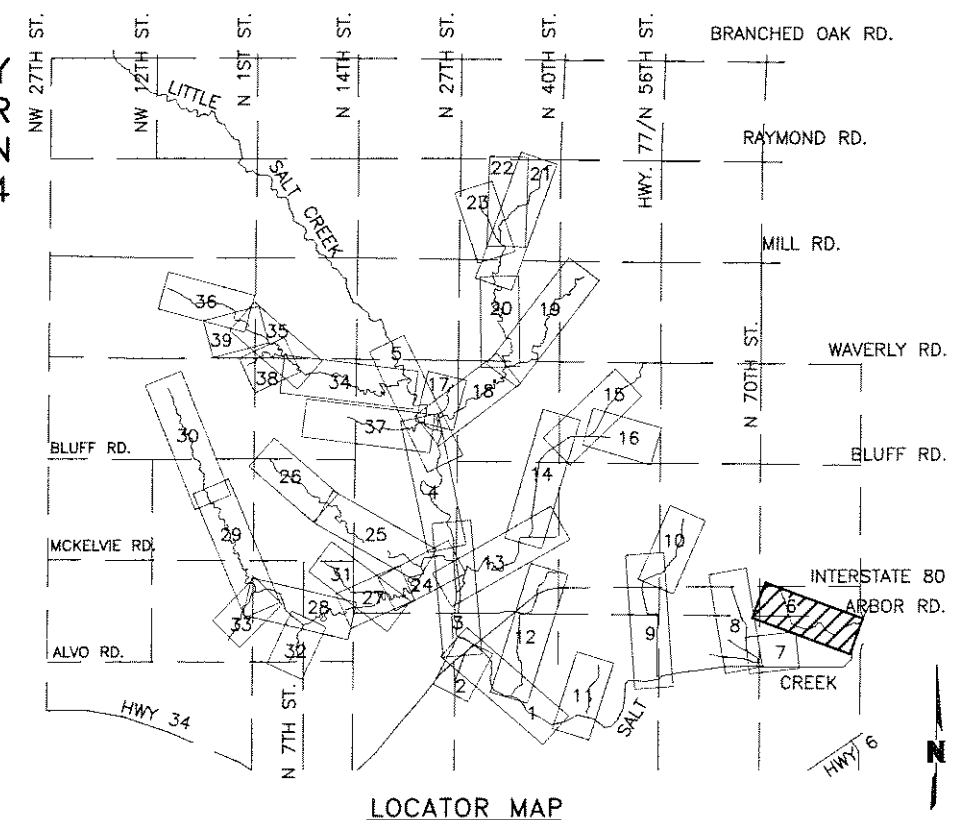
Runoff into saline wetlands is thought to cause dilution of the salinity level in the wetlands. It is thought that groundwater dissolves chlorides present in the underlying sandstone as it is forced towards the surface. Incision of the channel has reduced the amount of salt-impregnated ground water upwelling into the wetlands where it evaporates, leaving behind salt flats with an encrusted mantel of soil. The ground water is instead surfacing along the channel where it is confined to a much smaller area.

UPZ N-1
insert fullplot 13-G PROFILE
Stream segments 6 through 12



LOCATION OF ENVIRONMENTALLY
SENSITIVE WETLAND AND WATER
AREAS ARE SHOWN ON
FIGURES I-3 & I-4

- 2-YEAR
- 10-YEAR
- 100-YEAR
- 100-YEAR SALT CREEK FIS
- 500-YEAR



LOCATOR MAP



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Lincoln, Nebraska

Plan View of Stream Segment 6
Interim Stormwater Hydrology and Hydraulics Report for Lower Little Salt Creek Watershed

FIGURE: I-12H



Photo 9: Looking upstream from Arbor Road.



Photo 10: Looking easterly toward Salt Creek.

Stream Segment 6 in UPZ N-1

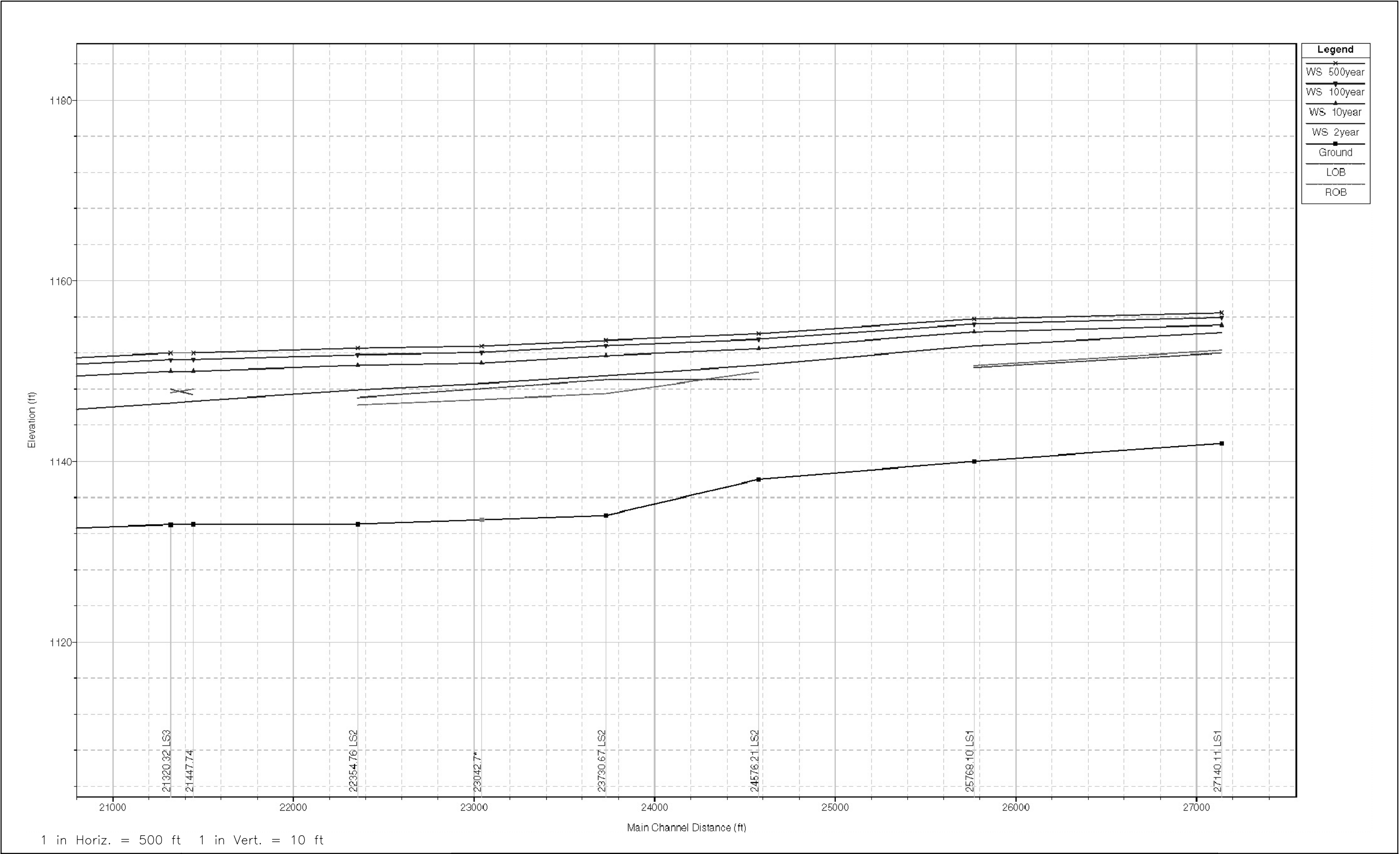
Evaluation

Stream Segment 6 is an unnamed tributary to Salt Creek draining the N-1R subbasin. This drainage basin starts north of Interstate 80 along North 70th Street. The Lincoln sludge injection site is in the upper part of the watershed. In the lower part of the watershed, between Interstate 80 and Arbor Road the existing land use is agricultural. The land use is projected to become industrial in the LLCCP. The channel is crossed by Arbor Road and then flows through the Ethel Abbott Sports Complex into Salt Creek.

- Reach Stability The stream segment in this basin has been modified by agricultural development between Interstate 80 and Arbor Road. The culvert at Arbor Road serves as a hard point for the channel.
- Flood Hazard No buildings appear to be within the limits of the 100-year floodplain. Commodities, crops, pasture and sports fields are subject to flood hazard. Most of the lower channel is in the Salt Creek FIS delineated floodplain. A farmstead is likely to be isolated by flooding over Arbor Road, but appears to be above the Salt Creek and N-1R channel flood water surface.
- Infrastructure There is no immediate threat apparent to overhead or buried utilities in the road Row. The crossing at Arbor Road does not meet current city stormwater criteria (see the hydraulics section for more information on overtopping frequency).
- Water Quality Runoff for this basin is predominantly from agricultural land. Natural riparian vegetation has been virtually eliminated throughout the length of the basin. Agricultural tillage encroaches to the top of bank along the channel. As the area develops, construction in this basin will be a source of sediment and other contaminants if the BMPs are not properly installed and maintained.
- Land Use and Ownership The land in the upper basin is publicly owned. The land in the lower basin on either side of the channel is privately owned and used for agricultural and recreational purposes. A portion of the lower N-1R drainage subbasin is in the Salt Creek floodplain.
- Multi-Purpose Use Potential Development and preservation of a minimum stream corridor would provide open space for this basin. Recreational use in the floodplain is an excellent demonstration of multi-purpose utilization of the floodplain.

Threat Matrix

Issue	Degree of Threat		
	Low	Medium	High
Reach Stability	X		
Flood Hazard Potential		X	
Infrastructure		X	
Water Quality		X	



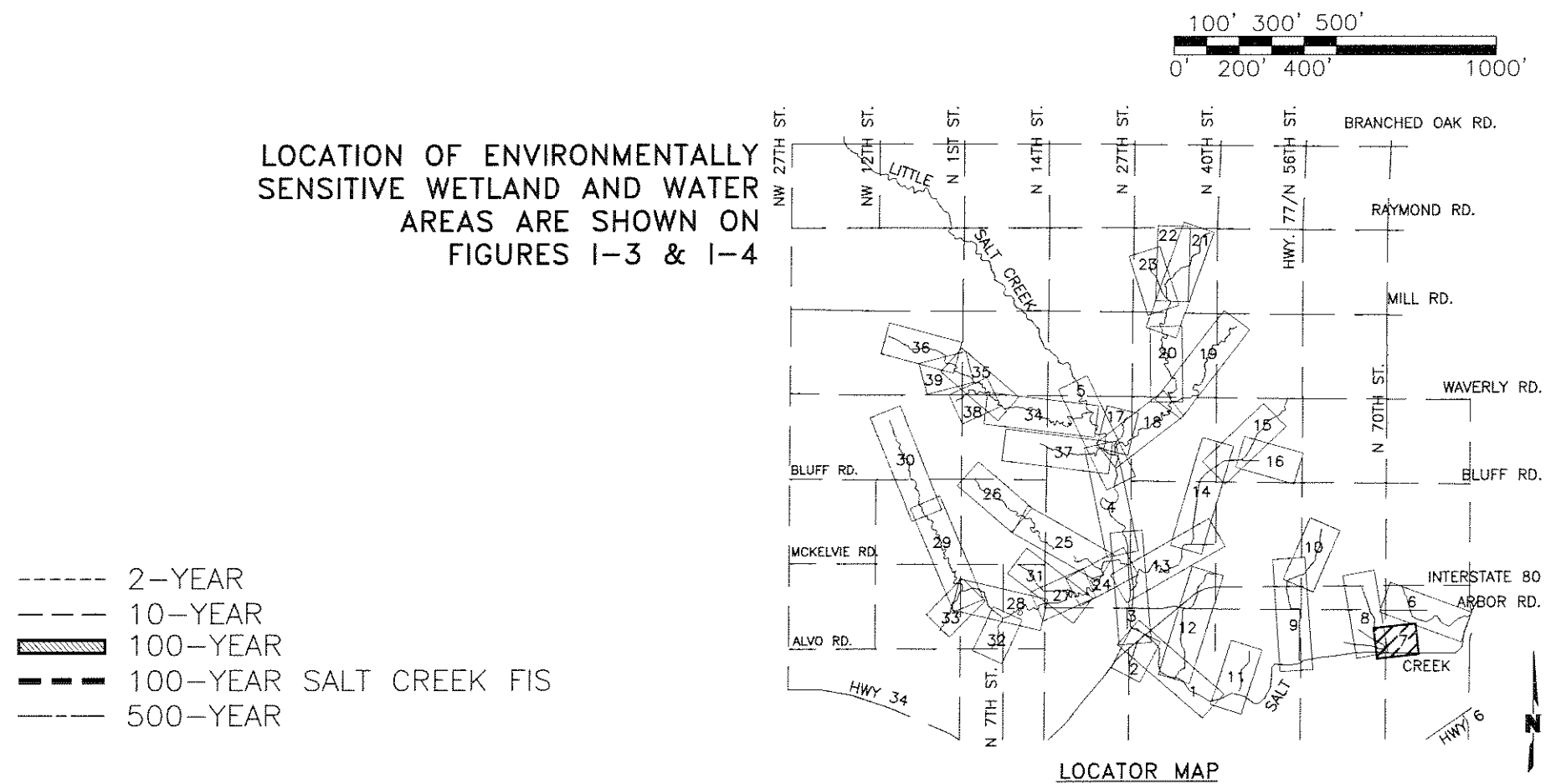




Photo 11: Looking downstream toward Salt Creek.



Photo 12: Looking upstream at detention pond.

Stream Segment 7 in UPZ N-1

Evaluation

Stream Segment 7 is the detention pond that receives runoff from the Abbot Sports Complex. It outlets via storm drain into Salt Creek. The entire complex is in the Salt Creek floodplain.

- Reach Stability The runoff from this subbasin is temporarily stored in a detention pond and released into Salt Creek.
- Flood Hazard The buildings appear to be above the 100-year floodplain. The sports fields and internal roads are subject to flood hazard. Plans call for construction of additional sports fields and supporting infrastructure. Some of the proposed improvements would need to meet “no-rise” regulations for development in the floodway.
- Infrastructure There is no immediate threat apparent to overhead or buried utilities. There are no public roadways in this stream segment.
- Water Quality Runoff for this basin is predominantly from recreational sports fields. Natural riparian vegetation has been virtually eliminated except for along the stream banks. As the area develops, construction in this basin will be a source of sediment and other contaminants if the BMPs are not properly installed and maintained.
- Land Use and Ownership The land is privately owned and used for recreational purposes.
- Multi-Purpose Use Potential These areas contain saline wetlands and may be used as protected habitat areas or ecological study areas. Development and preservation of a minimum stream corridor would provide open space for this basin. Recreational use in the floodplain is an excellent demonstration of multi-purpose utilization of the floodplain.

Threat Matrix

Issue	Degree of Threat		
	Low	Medium	High
Reach Stability	X		
Flood Hazard Potential		X	
Infrastructure	X		
Water Quality		X	

See Figure I-13I FIS Cross-sections U through X



Photo 13: Looking downstream toward Salt Creek.



Photo 14: Looking upstream toward Interstate 80 from Arbor Road.

Stream Segment 8 in UPZ N-1

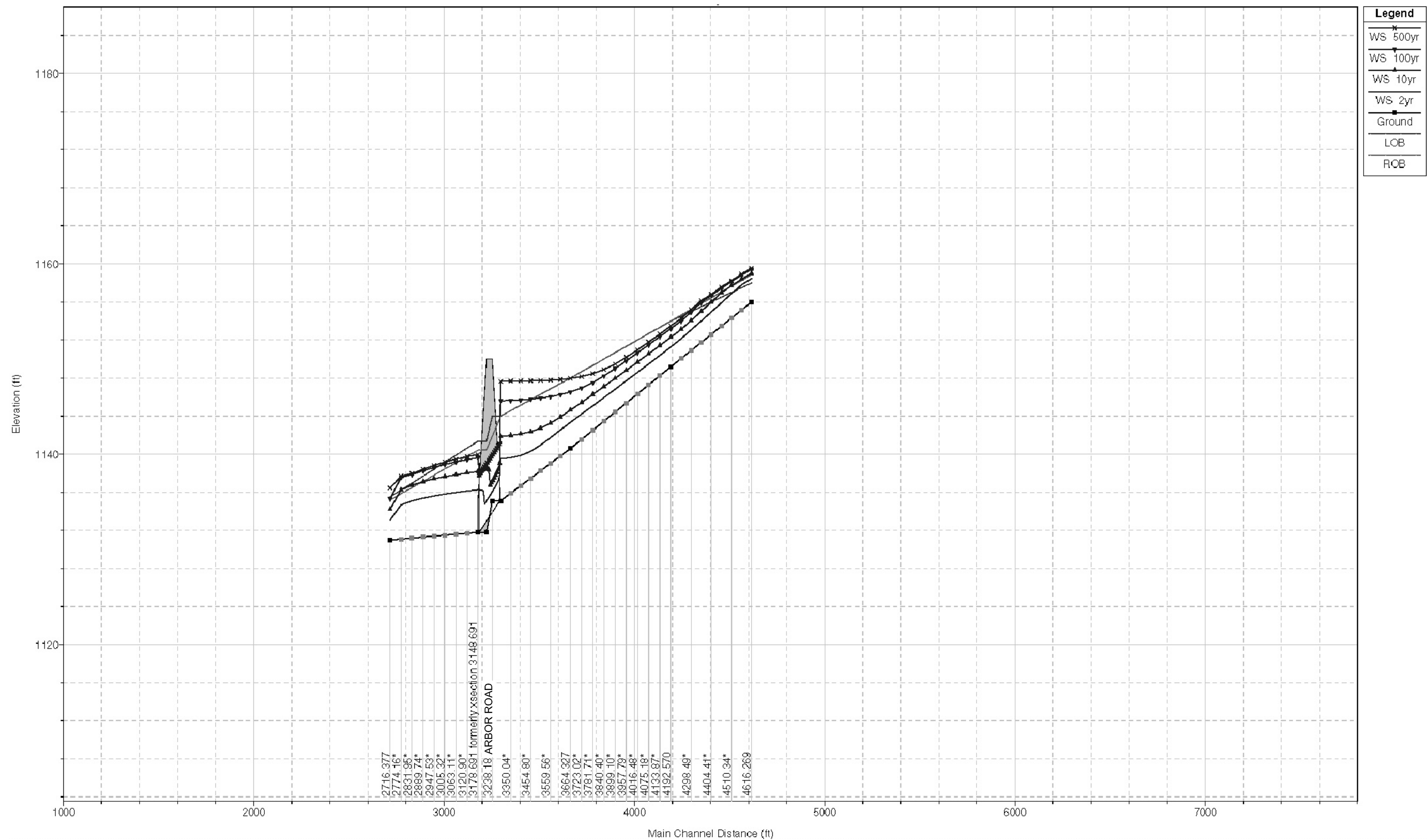
Evaluation

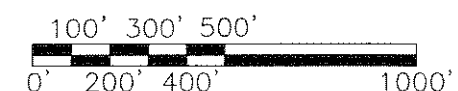
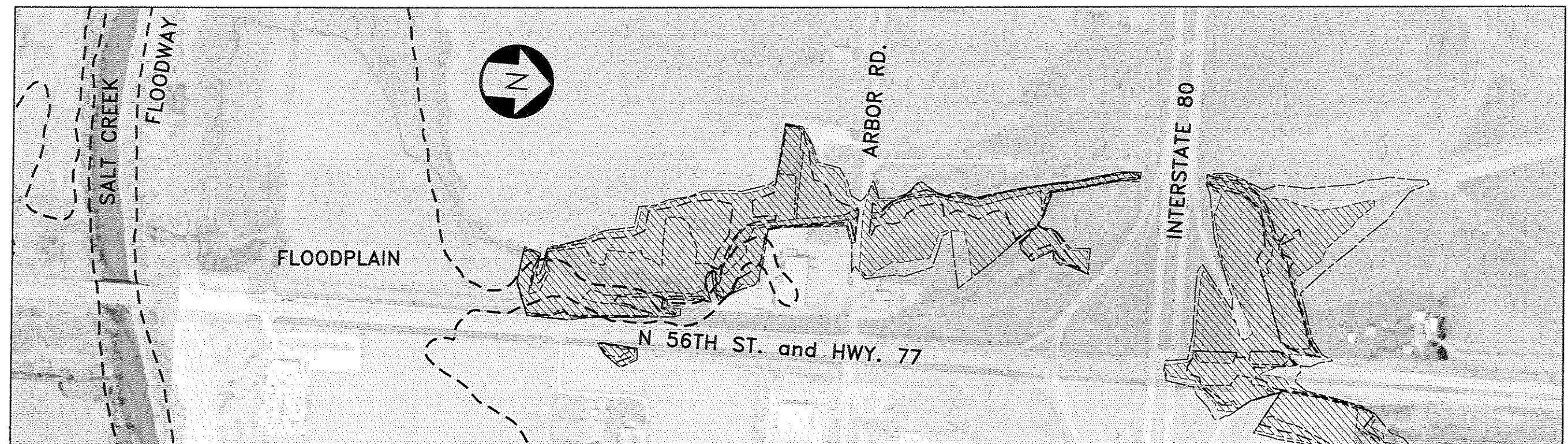
Stream Segment 8 is an unnamed tributary to Salt Creek draining the N-10 subbasin. This drainage basin starts northwest of the intersection of Interstate 80 and North 70th Street. The City of Lincoln owns the property in the upper part of the watershed. In the lower part of the watershed, between Interstate 80 and Arbor Road, the existing land use is mixed agricultural and industrial. The land use in this area is projected to become industrial in the LLCCP. The channel is crossed by Arbor Road and then flows through developing industrial land into Salt Creek.

- Reach Stability This reach has been modified by industrial development between Interstate 80 and Arbor Road. The culvert at Arbor Road serves as a hard point for the channel.
- Flood Hazard No buildings appear to be within the limits of the 100-year floodplain. A building pad has been prepared in the industrial tract along Salt Creek. Commodity crops and industrial land are subject to flood hazard. Most of the lower channel is in the Salt Creek FIS delineated floodplain.
- Infrastructure There is no immediate threat apparent to overhead or buried utilities in the road ROW. The crossing at Arbor Road meets current city stormwater criteria (see the hydraulics section for more information on overtopping frequency).
- Water Quality Runoff for this basin is predominantly from agricultural land. Natural riparian vegetation has been virtually eliminated throughout the length of the basin. Agricultural tillage encroaches to the top of bank along the channel. As the area develops, construction in this basin will be a source of sediment and other contaminants if the BMPs are not properly installed and maintained.
- Land Use and Ownership The land in the upper basin is publicly owned. The land in the lower basin on either side of the channel is privately owned and used for agricultural and industrial purposes. A portion of the lower N-10 drainage subbasin is in the Salt Creek floodplain and floodway.
- Multi-Purpose Use Potential Development and preservation of a minimum stream corridor would provide open space for this basin. A direct connection with Salt Creek enhances the viability has a wildlife and habitat corridor. Preservation of the existing floodplain storage volume would help mitigate the impact of projected development in the watershed. A saline wetland mitigation site has been constructed in conjunction with the proposed industrial development.

Threat Matrix

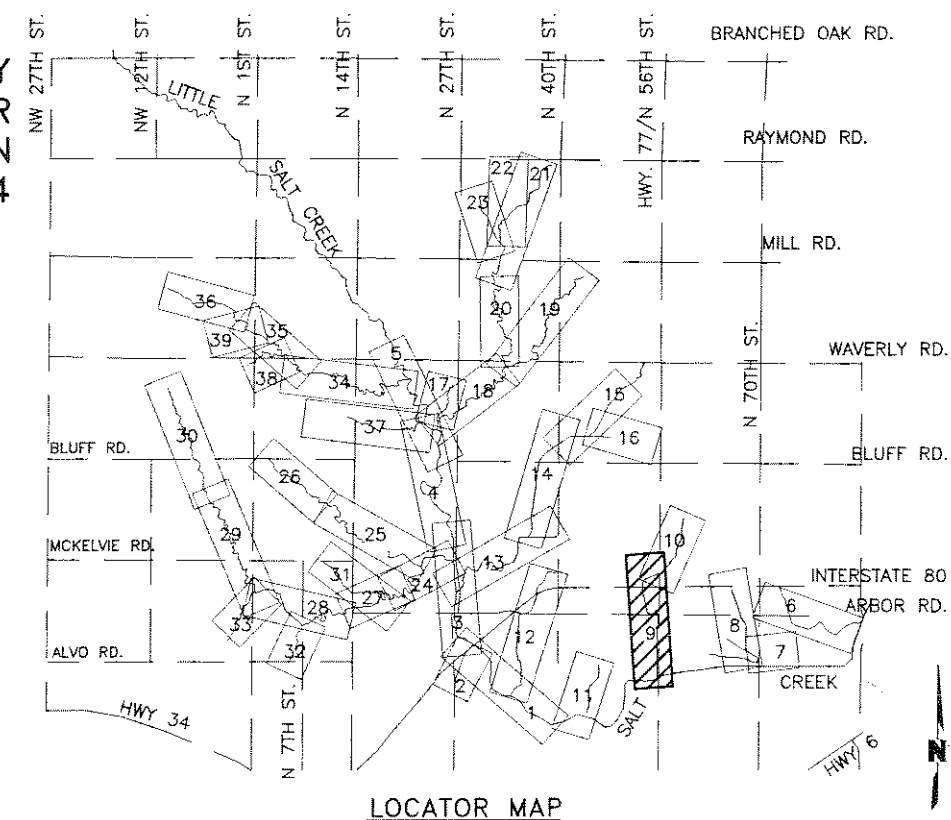
Issue	Degree of Threat		
	Low	Medium	High
Reach Stability		X	
Flood Hazard Potential		X	
Infrastructure		X	
Water Quality	X		





LOCATION OF ENVIRONMENTALLY
SENSITIVE WETLAND AND WATER
AREAS ARE SHOWN ON
FIGURES I-3 & I-4

- 2-YEAR
- 10-YEAR
- 100-YEAR
- 100-YEAR SALT CREEK FIS
- 500-YEAR



LOCATOR MAP



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Lincoln, Nebraska

Plan View of Stream Segment 9

Interim Stormwater Hydrology and Hydraulics Report for Lower Little Salt Creek Watershed

FIGURE: I-12K



Photo 15: Looking downstream at Salt Creek.



Photo 16: Looking downstream from Arbor Road.

Stream Segment 9 in UPZ N-1

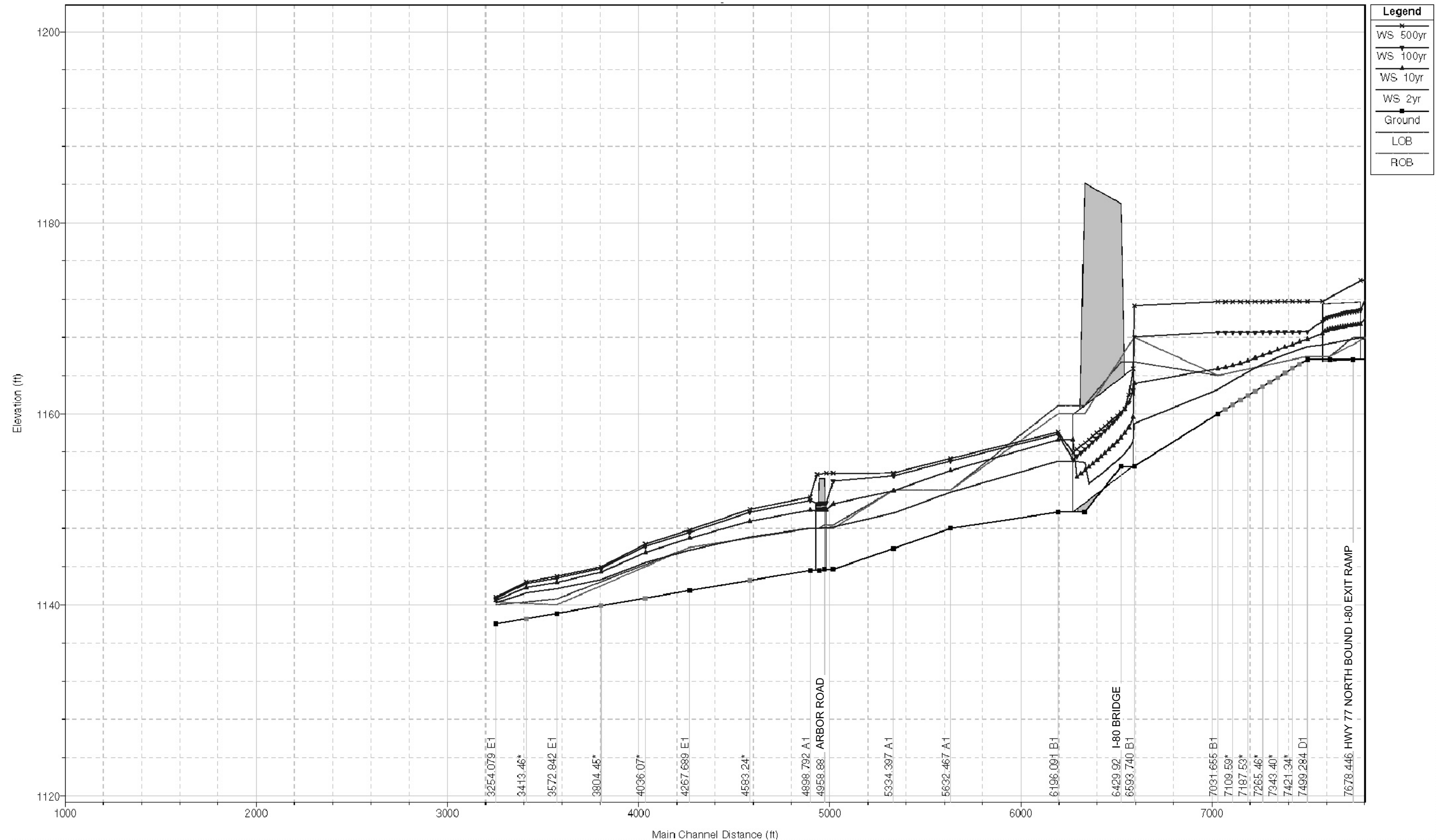
Evaluation

Stream Segment 9 is the main branch of the N-1S-C1 subbasin commencing at the confluence with Salt Creek and proceeding on the east side of Highway 77/56th Street. It is crossed by several private drives and Arbor Road. The land adjacent to this segment is currently in agricultural and industrial land use.

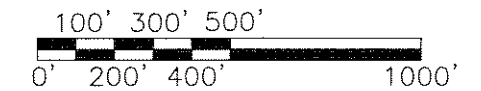
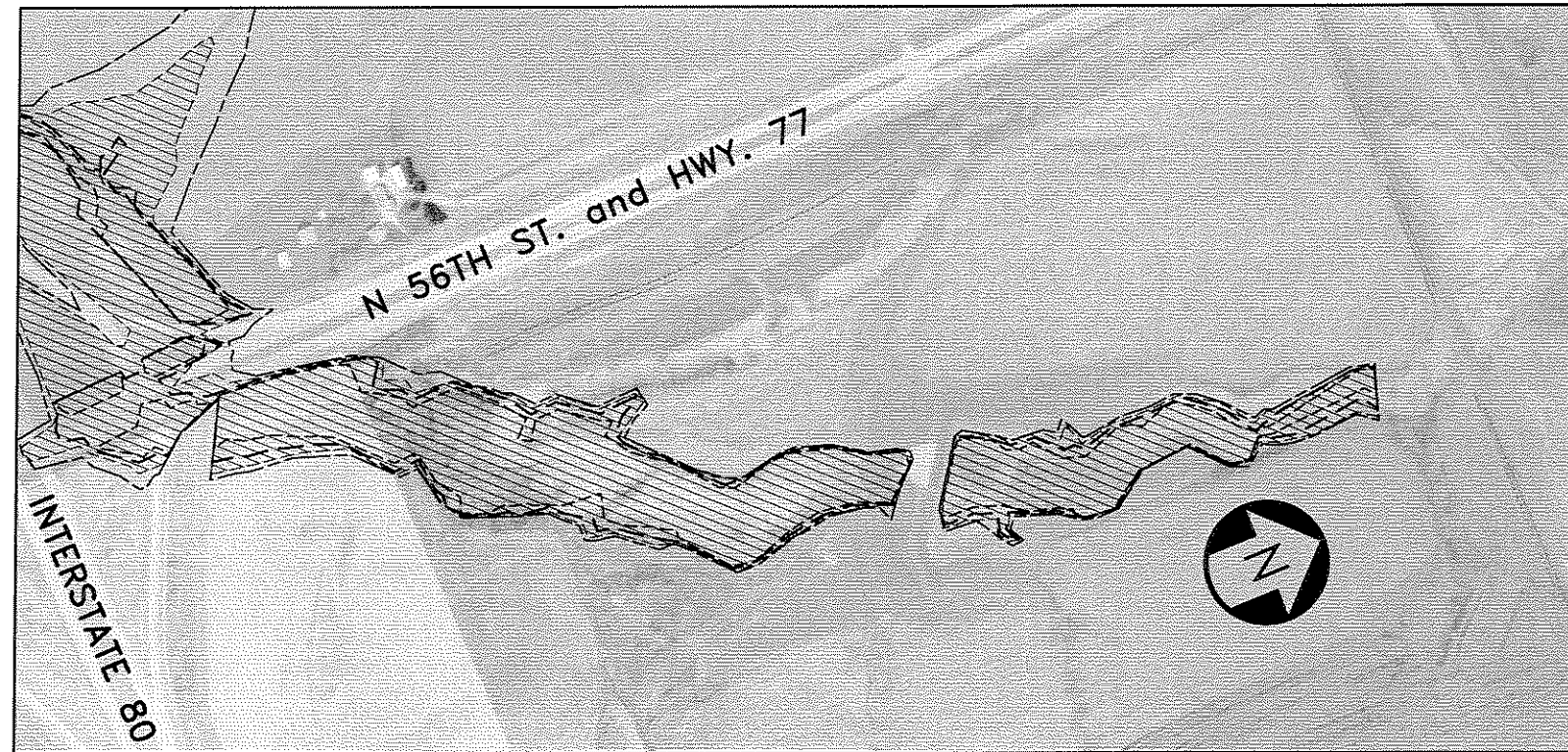
- Reach Stability The stream segment has been heavily modified by commercial development south of Interstate 80. The culverts at the private drives serve as hard points for the channel. A concrete letdown structure on Salt Creek protects the banks from erosion.
- Flood Hazard A Corrugated Metal Pipe (CMP) storm drain conduit has been installed in the channel north of Arbor Road. It appears to be severely undersized, increasing the flood hazard to any future buildings constructed on the site. No existing buildings appear to be within the limits of the 100-year floodplain.
- Infrastructure There is no immediate threat apparent to overhead or buried utilities in the road Row. The roadway crossings in this basin do not meet DCM minimum overtopping requirements (see the hydraulics section for more information on overtopping frequency).
- Water Quality Runoff for this basin is predominantly from the landfill and agricultural land north of Interstate 80, and commercial development south of Interstate 80. Natural riparian vegetation has been virtually eliminated throughout the length of the basin. Agricultural tillage and commercial development has encroached to the top of bank. As the area develops, construction in this basin will be a source of sediment and other contaminants if the BMPs are not properly installed and maintained.
- Land Use and Ownership The land west of Highway 77 is privately held in agricultural land use. Commercial development is projected for the area in the LLCCP. The lower portion of the drainage basin is in the Salt Creek floodplain and floodway.
- Multi-Purpose Use Potential The Salt Creek floodplain could provide opportunities for connecting corridors along the channel.

Threat Matrix

Issue	Degree of Threat		
	Low	Medium	High
Reach Stability		X	
Flood Hazard Potential			X
Infrastructure		X	
Water Quality		X	

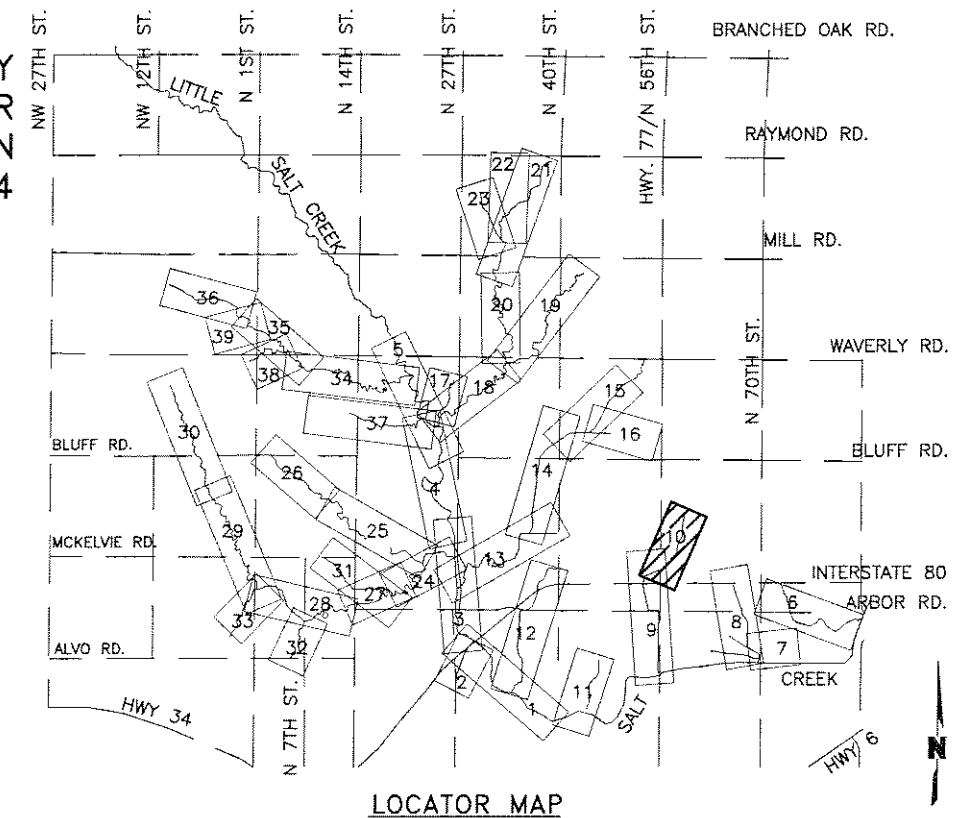


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LOCATION OF ENVIRONMENTALLY
SENSITIVE WETLAND AND WATER
AREAS ARE SHOWN ON
FIGURES I-3 & I-4

- 2-YEAR
- 10-YEAR
- 100-YEAR
- 100-YEAR SALT CREEK FIS
- 500-YEAR



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Plan View of Stream Segment 10

Interim Stormwater Hydrology and Hydraulics Report for Lower Little Salt Creek Watershed

FIGURE: I-12L



Photo 17: Looking upstream from Arbor Road at the CMP culvert.



Photo 18: Looking downstream from 56th Street.

Stream Segment 10 UPZ N-1

Evaluation

Stream Segment10 starts upstream of Arbo Road, proceeds northerly, and is crossed by Interstate 80 and Highway 77/North56th Street. This basin is currently in agricultural, industrial, and public land use with several acreages and farmsteads.

- Reach Stability The stream segment has been heavily modified by commercial development and construction of Interstate 80. The culverts at Interstate 80 and Highway 77 serve as hard points for the channel.
- Flood Hazard Flows will overtop the intersection of the Interstate 80 west-bound off-ramp and Highway 77. These flows will likely cause ponding underneath the Interstate 80 interchange. No existing buildings appear to be within the limits of the 100-year floodplain.
- Infrastructure There is no immediate threat apparent to overhead or buried utilities in the road ROW. Interstate 80 meets DCM minimum overtopping requirements, but not the culvert under Highway 77 (see the hydraulics section for more information on overtopping frequency).
- Water Quality Runoff for this basin is predominantly from the landfill and agricultural land north of the Interstate. Runoff from the active face of the landfill for up to the 25-year rainfall is captured and retained on-site. Natural riparian vegetation has been virtually eliminated throughout the length of the stream segment. Agricultural tillage and roadway development has encroached to the top of bank.
- Land Use and Ownership The Bluff Road Landfill, owned by the City of Lincoln Public Works Department is in the upper watershed. It is the primary solid disposal facility for the citizens of Lincoln. The land west of Highway 77 is privately held in agricultural land use. An acreage is present north of Interstate 80. No further development is projected by the LLCCP.
- Multi-Purpose Use Potential The landfill is currently using land in the uppermost subbasin. Additional land immediately to the south is currently owned by the City of Lincoln Public Works and Utilities Department and will be used as landfill space once the existing area reaches capacity. Retired areas of the landfill can be used for parks. Interstate 80 is a significant barrier to a public use destination in the upper part of the watershed.

Threat Matrix

Issue	Degree of Threat		
	Low	Medium	High
Reach Stability	X		
Flood Hazard Potential			X
Infrastructure		X	
Water Quality		X	

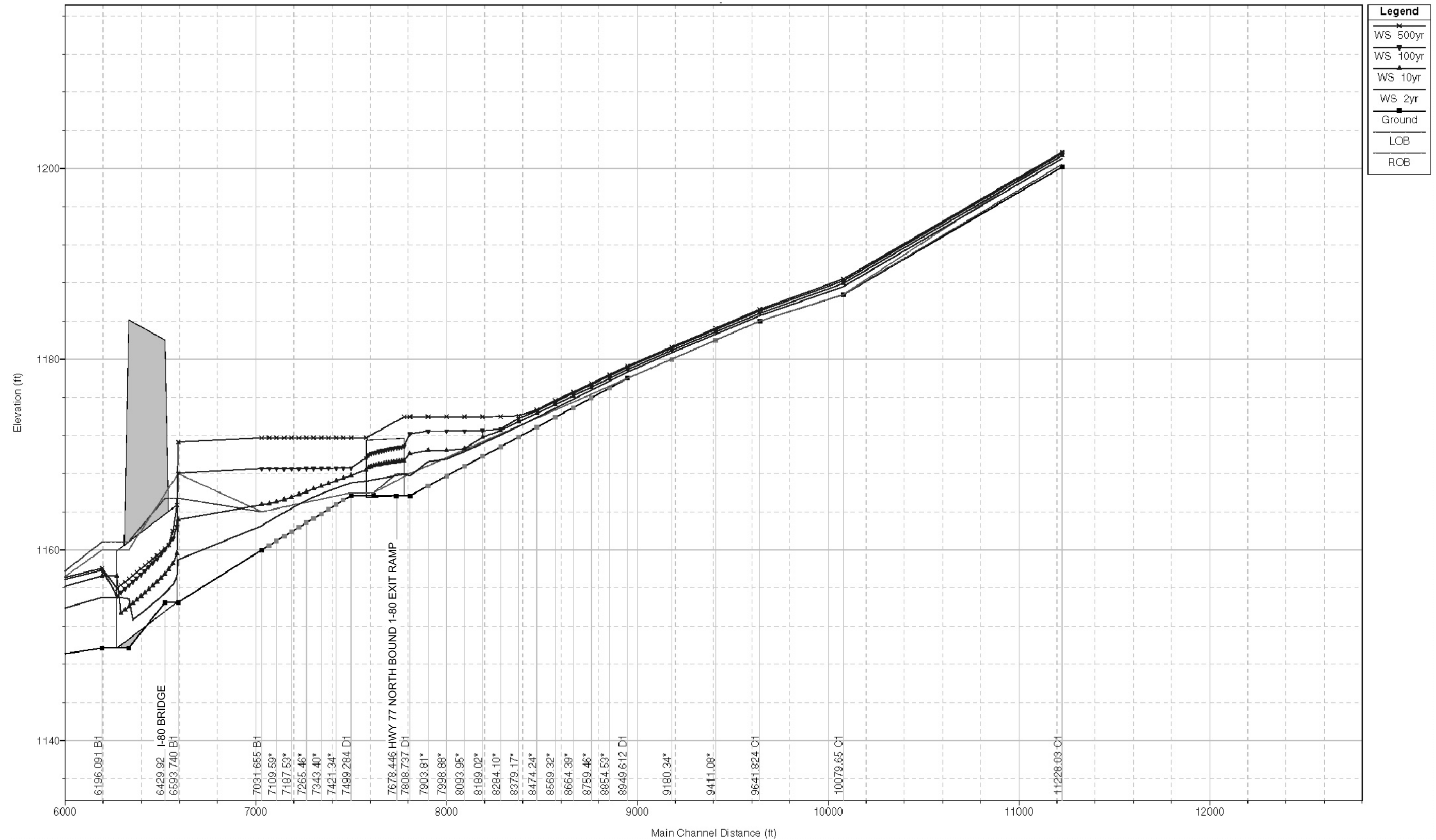




Photo 19: Looking toward Salt Creek from Arbor Road.

Stream Segment 11 in UPZ N-1

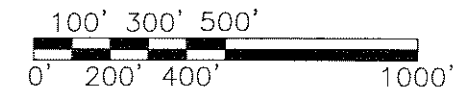
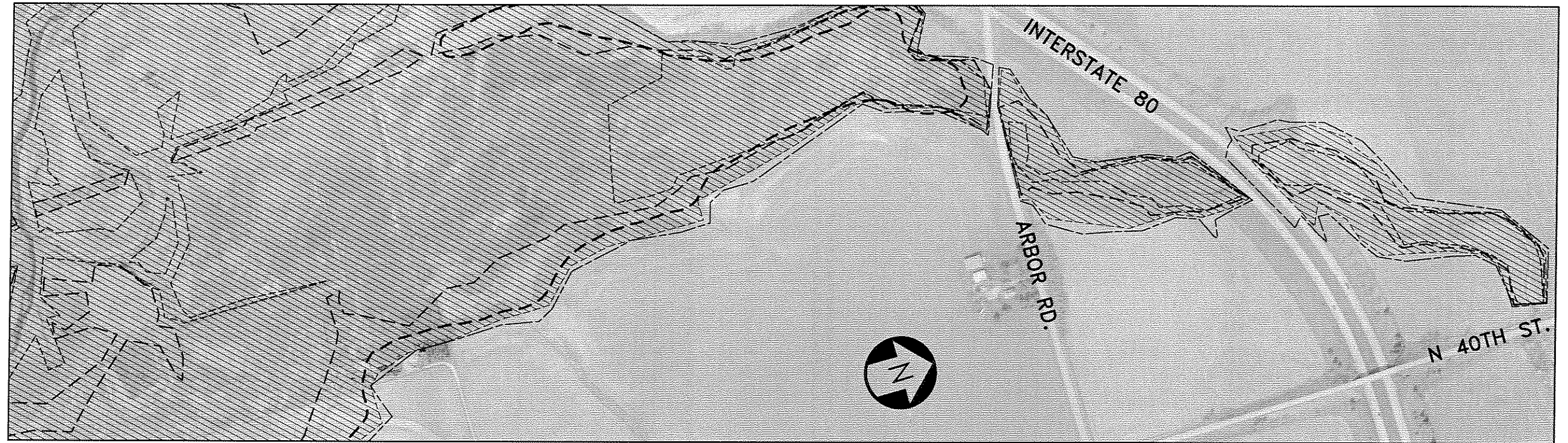
Evaluation

The Stream Segment 11 drains the area south of the west-bound Interstate 80 rest area, generally bounded on the east and west by North 52nd Street (extended) and North 40th Street, respectively. It is an unnamed tributary to Salt Creek. The entire stream segment is in the Salt Creek floodplain and no new flood profiles were determined. The basin is in agricultural land use with scattered farmstead dwellings.

- Reach Stability The watershed discharges into freshwater and saline wetlands and then outlets into Salt Creek.
- Flood Hazard The area adjacent to the stream is crop and pasture land. Commodity crops and pasture along the channel are subject to flood hazard. No buildings appear to be within the limits of the delineated Salt Creek floodplain.
- Infrastructure There are no apparent overhead or buried utilities.
- Water Quality Runoff from adjacent and upstream crop land is the dominant characteristic currently affecting surface water quality. The amount of natural riparian vegetation has been reduced through stream modification and agricultural tillage to the top of stream banks. Runoff from the watershed, if allowed to continue to flow into the saline wetlands, will likely dilute the salinity of the wetlands.
- Land Use and Ownership The land around this stream segment is privately held. The land use is agricultural and private recreational. It is projected to be developed into environmental resource land use by the LLCCP.
- Multi-Purpose Use Potential These areas contain saline wetlands. Due to the presence of the potential Salt Creek Tiger Beetle habitat, some restrictions on land use will likely be developed. Based on the Mayor's Salt Creek Tiger Beetle Cabinet Report, it is likely that open spaces (buffer zones) will be created or maintained. These areas may be used as protected habitat areas or ecological study areas. A direct connection with Salt Creek enhances the viability as a wildlife and habitat corridor. Preservation of the existing floodplain storage volume would help mitigate the impact of projected development in the watershed.

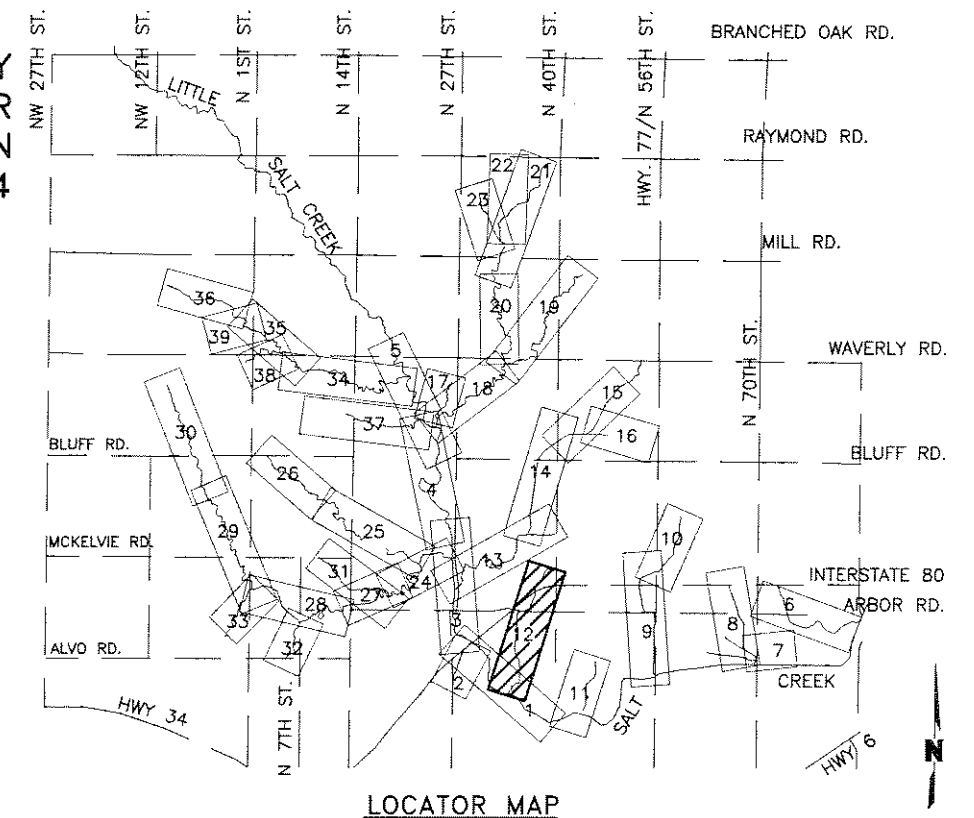
Threat Matrix

Issue	Degree of Threat		
	Low	Medium	High
Reach Stability	X		
Flood Hazard Potential	X		
Infrastructure	X		
Water Quality		X	



LOCATION OF ENVIRONMENTALLY
SENSITIVE WETLAND AND WATER
AREAS ARE SHOWN ON
FIGURES I-3 & I-4

- 2-YEAR
- 10-YEAR
- 100-YEAR
- 100-YEAR LITTLE SALT CREEK FIS
- 500-YEAR



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Plan View of Stream Segment 12

Interim Stormwater Hydrology and Hydraulics Report for Lower Little Salt Creek Watershed

FIGURE: I-12N



Photo 20: Looking downstream from North 40th Street.



Photo 21: Looking downstream from Arbor Road.

Stream Segment 12 in UPZ N-1

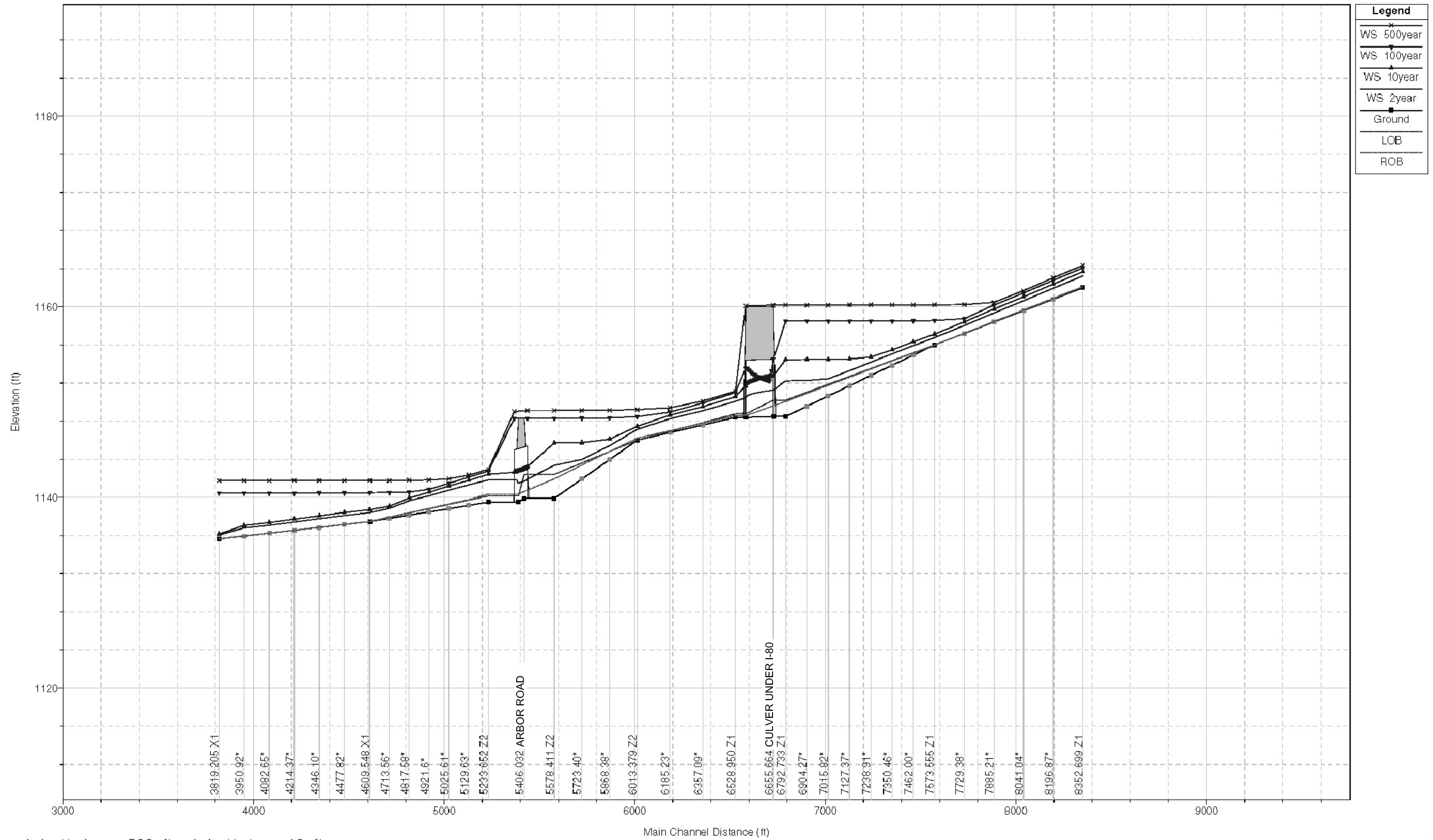
Evaluation

Stream segment 12 is an unnamed tributary to Little Salt Creek. It is grouped with UPZ N-1 tributaries because of its proximal location and similar projected land use with UPZ N–1. Starting from a confluence with Little Salt Creek, the segment runs through a saline wetland and is crossed by Arbor Road and Interstate 80. The basin is in agricultural land use with scattered farmstead dwellings.

- Reach Stability The channel near the confluence shows signs of active stream bed and bank erosion. The predominant factor causing this erosion is head cutting to meet the Little Salt Creek channel. The culverts at Arbor Road and Interstate 80 serve as hard points for the channel.
- Flood Hazard The area adjacent to the streams in this basin is undeveloped. Flooding is confined to crop land and wetlands. Buildings associated with a farmstead on Alvo Road appear to be within the limits of the 100-year floodplain.
- Infrastructure There is no immediate threat apparent to overhead or buried utilities in the road ROW. The Arbor Road and Interstate 80 roadway crossings meet the DCM minimum overtopping requirements (see the hydraulics section for more information on overtopping frequency).
- Water Quality Runoff from adjacent and upstream crop land is the dominant characteristic affecting surface water quality. Riparian habitat has been preserved in the stream segment south of Interstate 80. The amount of natural riparian vegetation in the upper portion of the stream segment has been reduced or eliminated by agricultural tillage to the top of stream banks. As the area develops, construction upstream of this reach will be a source of sediment and other contaminants if BMPs are not properly installed and maintained. Increased volume of runoff from the developed area, if allowed to flow into the saline wetlands, will likely dilute the salinity of the wetlands.
- Land Use and Ownership The land around these stream segments is privately held. The land use is agricultural and wetlands. The lower portion of the stream segment is projected to be environmental resources land use in the LLCCP.
- Multi-Purpose Use Potential Due to the presence of the potential Salt Creek Tiger Beetle habitat at the confluence of Little Salt Creek, some restrictions on land use will likely be developed. Based on the Mayor's Salt Creek Tiger Beetle Cabinet Report, it is likely that open spaces (buffer zones) will be created or maintained. These areas may be used as protected habitat areas or ecological study areas. A direct connection with Salt Creek enhances the viability as a wildlife and habitat corridor.

Threat Matrix

Issue	Degree of Threat		
	Low	Medium	High
Reach Stability			X
Flood Hazard Potential		X	
Infrastructure		X	
Water Quality		X	



1 in Horiz. = 500 ft 1 in Vert. = 10 ft



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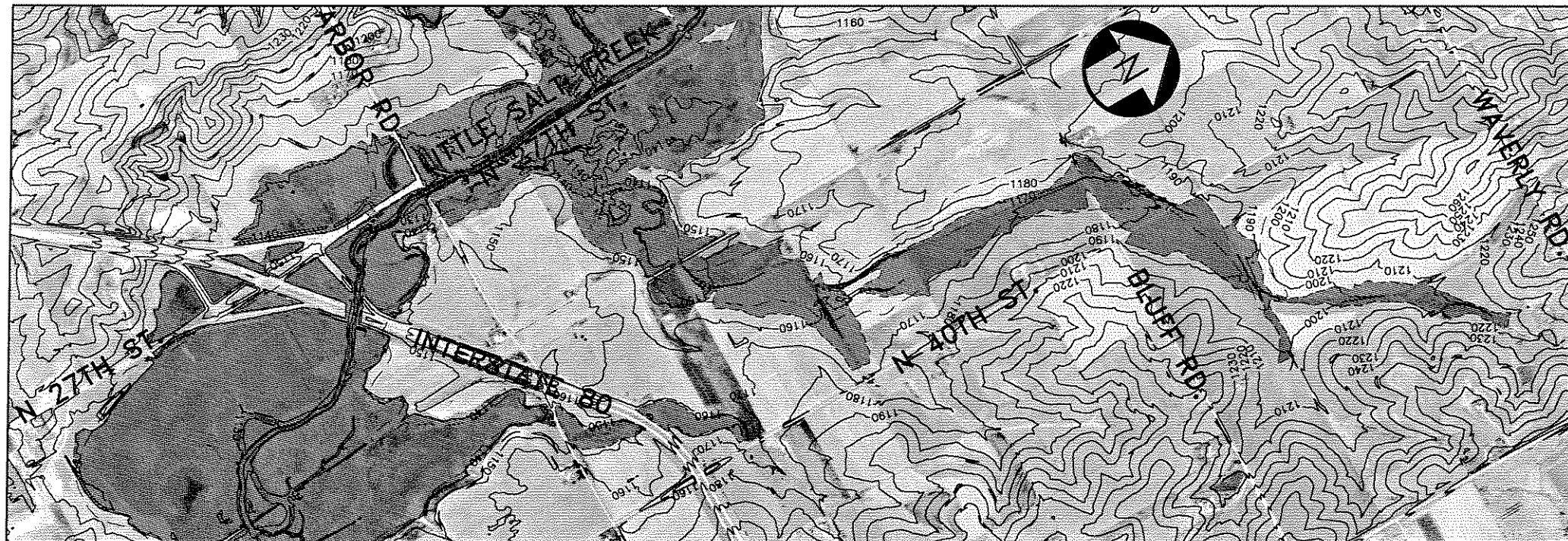
Lincoln, Nebraska

Stream Segment 12

Interim Stormwater Hydrology and Hydraulics Report for Lower Little Salt Creek Watershed

FIGURE: I-13N

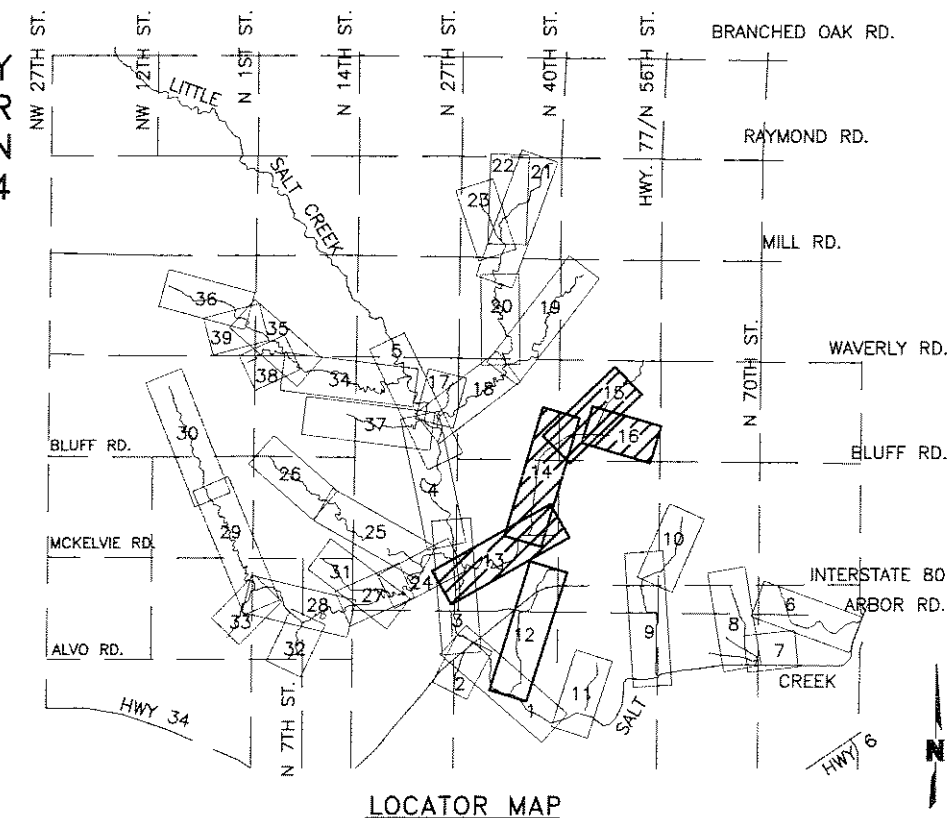
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0' 1000' 2000' 4000'

LOCATION OF ENVIRONMENTALLY
SENSITIVE WETLAND AND WATER
AREAS ARE SHOWN ON
FIGURES I-3 & I-4

100-YEAR
100-YEAR LITTLE SALT CREEK FIS



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Plan View of UPZ N-2 Mainstem

Interim Stormwater Hydrology and Hydraulics Report for Lower Little Salt Creek Watershed

FIGURE: I-120

Stream Segment Evaluation

UPZ N-2 (Stream Segments 13 through 16)

Stream Segments 13 through 16 comprise the mainstem of the N-2 watershed. Starting from the confluence with Little Salt Creek, the segments are crossed by North 27th Street, the abandoned Chicago/Northwest Railroad line, Bluff Road, and North 40th Street. The predominant land use in the basin is agricultural with scattered acreages and farmstead dwellings. Saline soils and wetlands are found near 27th Street. The following evaluation discussion applies to all of the stream segments in this basin unless otherwise noted.

Reach Stability

UPZ N-2 shows signs of active stream bed and bank erosion. The predominant factor causing this erosion is head cutting that is proceeding upstream from Little Salt Creek. Stream flow velocities exceed 5 fps downstream of North 40th Street. The culverts at North 27th Street and at North 40th Street serve as hard points in the channel.

Flood Hazard Potential

Commodities, crops, and pasture land along the channel are subject to flood hazard. No buildings appear to be within the limits of the 100-year floodplain.

Threats to Infrastructure

There is no immediate threat apparent to overhead or buried utilities in the road ROW. The roadway crossings in this basin are listed below (see the hydraulics section for more information on overtopping frequency). Roadways subject to frequent overtopping require more frequent maintenance.

<u>Stream Segment</u>	<u>Road Crossing</u>	<u>Meets DCM Criteria?</u>
13	North 27 th Street	No
14	Bluff Road	No
14	North 40 th Street	No

Land Use and Ownership

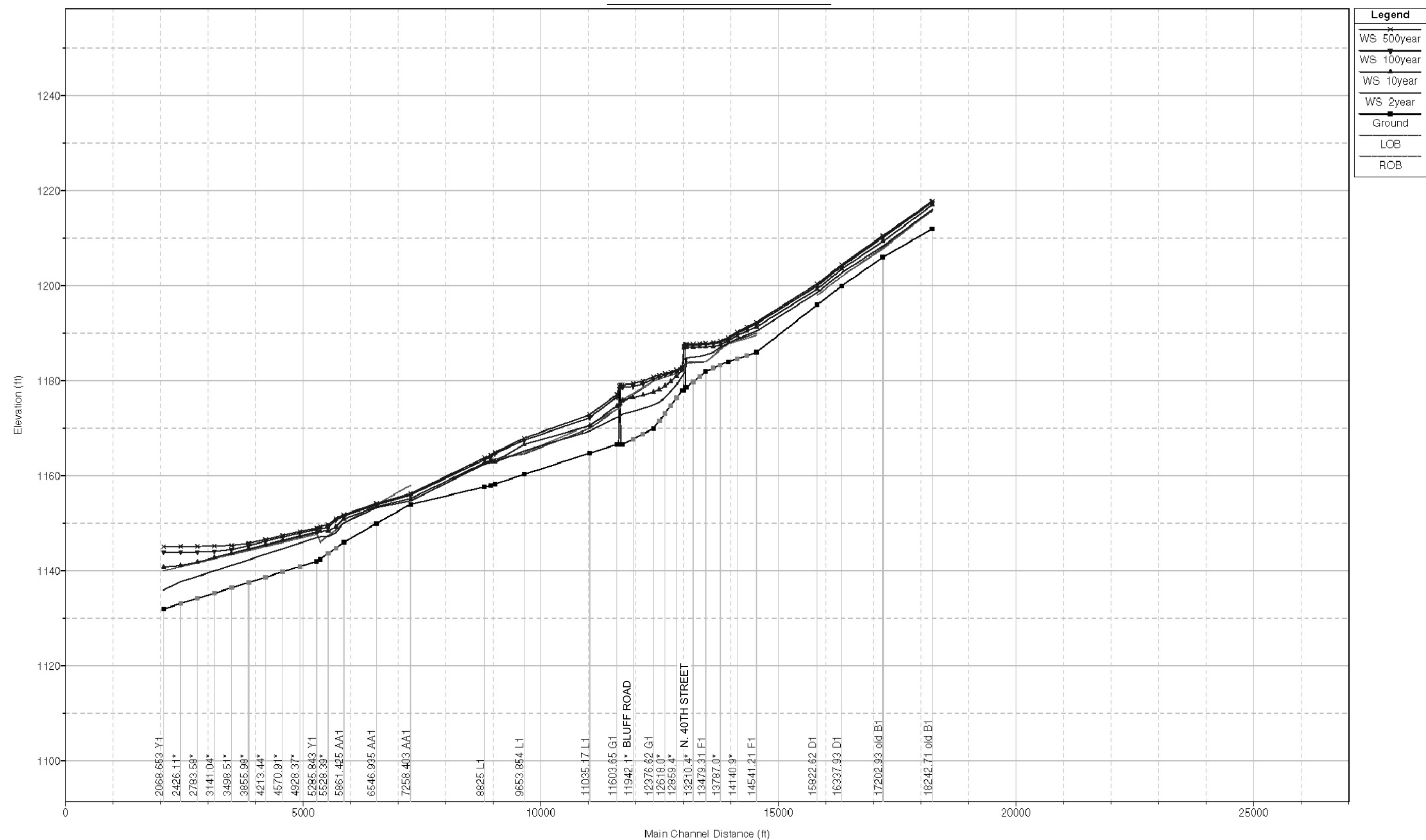
The land around these stream segments is privately held except for the Arbor Lake wetlands, which are owned by the City of Lincoln and managed by the Nebraska Game and Parks Commission. The land use is agricultural and pasture land. The area is not projected for development by the LLCCP.

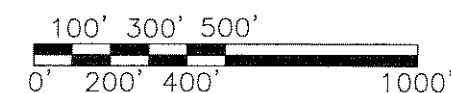
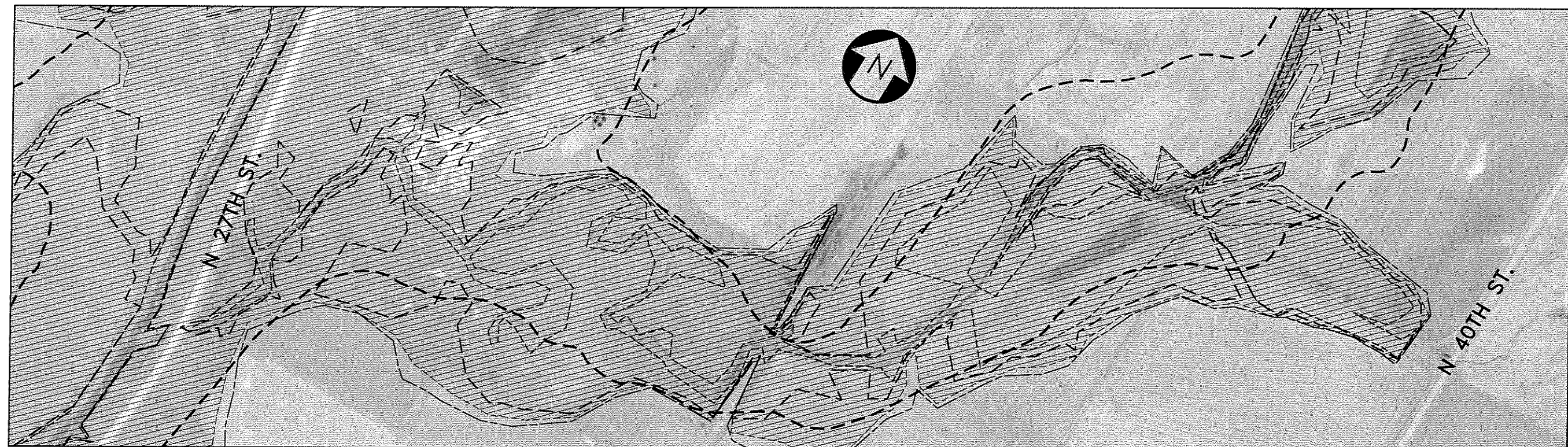
Multi-Purpose Use Potential

Due to the presence of the potential Salt Creek Tiger Beetle habitat at the confluence of Salt Creek and the N-2 tributary, some restrictions on land use will likely be developed. Based on the Mayor's Salt Creek Tiger Beetle Cabinet Report, it is likely that open spaces (buffer zones) will be created or maintained. These areas may be used as protected habitat areas or ecological study areas.

Water Quality

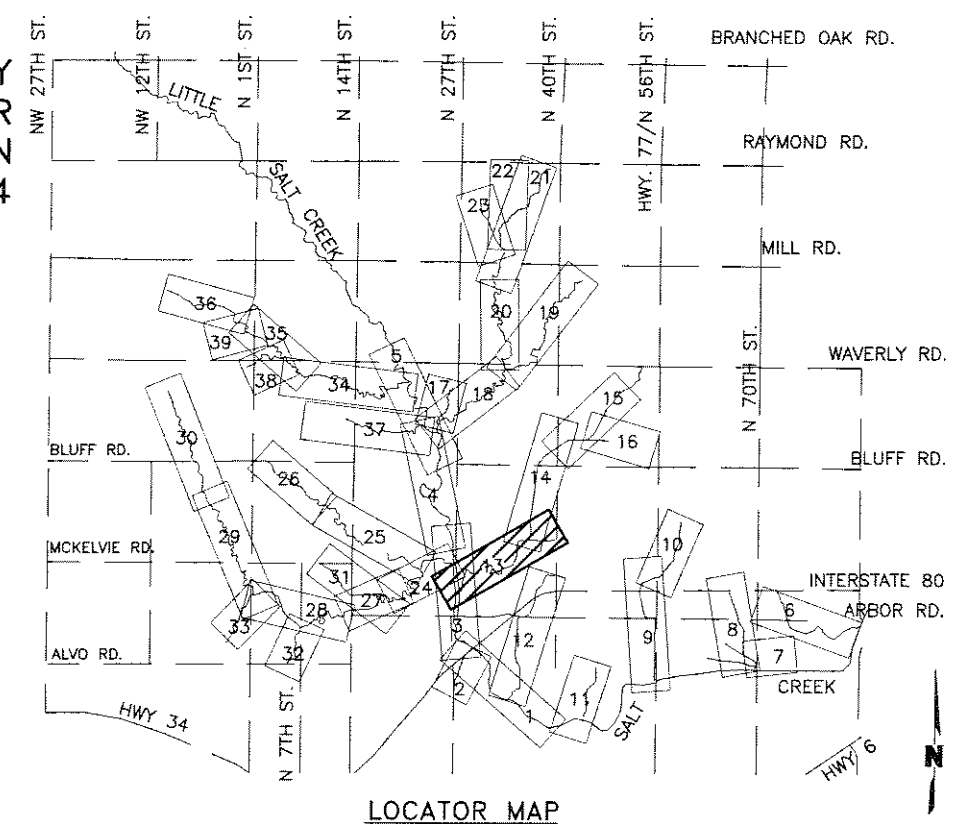
Runoff from adjacent and upstream crop land is the dominant characteristic affecting surface water quality. The amount of natural riparian vegetation has been reduced through stream modification and agricultural tillage to the top of stream banks.





LOCATION OF ENVIRONMENTALLY
SENSITIVE WETLAND AND WATER
AREAS ARE SHOWN ON
FIGURES I-3 & I-4

- 2-YEAR
- - - - - 10-YEAR
- 100-YEAR
- 100-YEAR LITTLE SALT CREEK FIS
- 500-YEAR



LOCATOR MAP



Photo 22: Looking upstream from North 27th Street along mainstem.



Photo 23: Looking downstream from North 40th Street at upper reach.

Stream Segment 13 in UPZ N-2

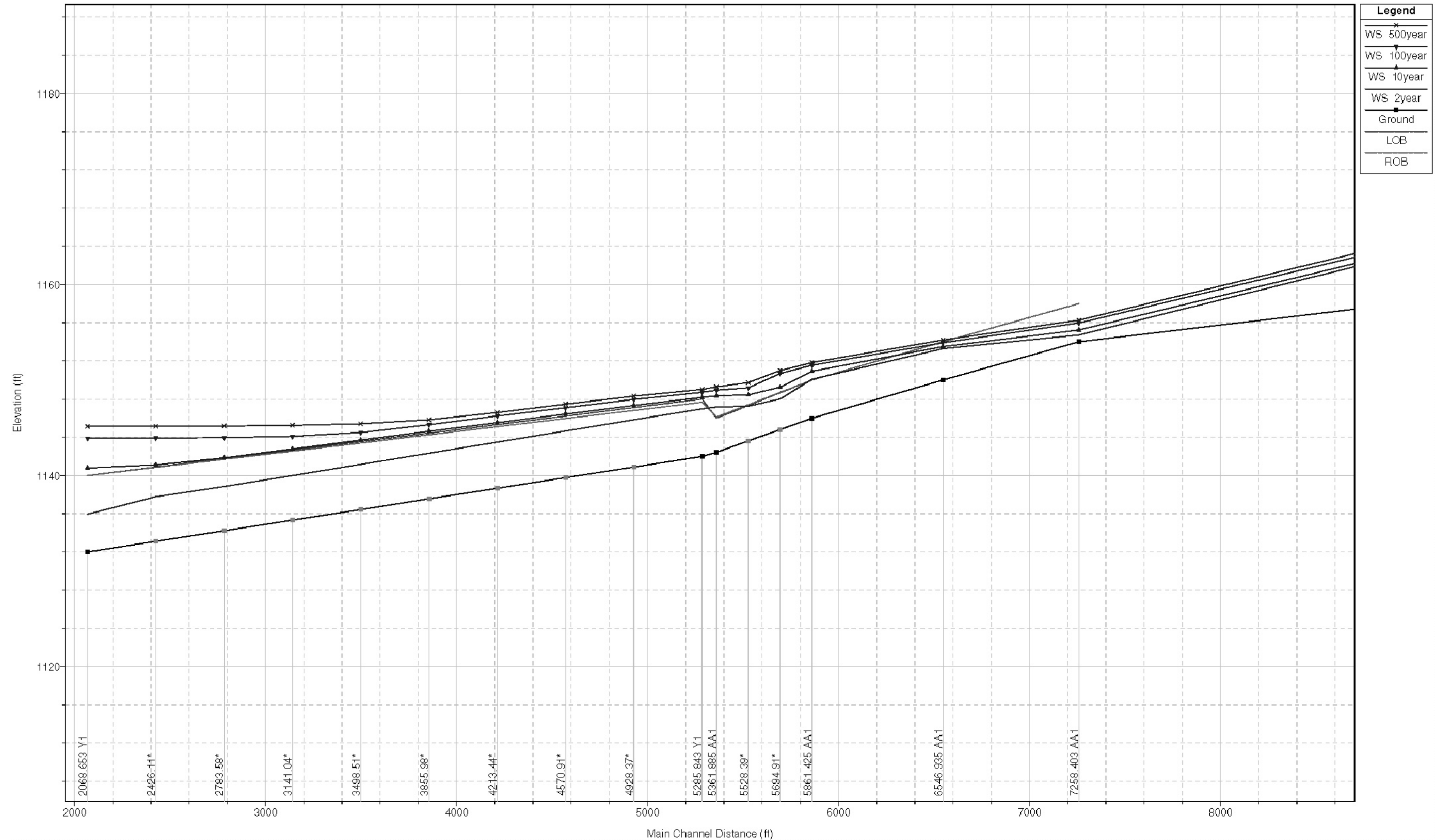
Evaluation

Stream Segment 13 begins at the confluence with Little Salt Creek and extends nearly to North 40th Street. North 27th Street and the abandoned Chicago/Northwest Railroad line cross the channel. The Arbor Lake wetlands are located adjacent to the channel.

- Reach Stability This reach shows signs of active stream bed and bank erosion. The predominant factor causing this erosion is head cutting that is proceeding upstream from Little Salt Creek. The culvert at North 27th Street serves as a hard point in the channel. There is some evidence of head cutting upstream of the culvert. The abandoned Chicago/Northwest Railroad grade causes a restriction in the channel, resulting in locally erosive velocities.
- Flood Hazard Commodities, crops, pasture and wetlands along the channel are subject to flood hazard. The channel has about a 10-year capacity. No buildings appear to be within the limits of the 100-year floodplain.
- Infrastructure There is no immediate threat apparent to overhead or buried utilities in the road ROW. The roadway crossing at North 27th Street does not meet minimum DCM requirements due to flooding in Little Salt Creek (see the hydraulics section for more information on overtopping frequency).
- Water Quality Runoff from adjacent and upstream crop land is the dominant characteristic affecting surface water quality. The lower portion of the segment is grazed pasture. The amount of natural riparian vegetation in the upper part of this segment has been reduced through stream modification and agricultural tillage to the top of stream banks.
- Land Use and Ownership The land around this stream segment is privately held; except for the Arbor Lake wetlands, which are owned by the City of Lincoln and managed by the Nebraska Game and Parks Commission. The land use is agricultural. The area is projected for development as an environmental resources land use by the LLCCP.
- Multi-Purpose Use Potential These areas contain saline wetlands. Due to the presence of the potential Salt Creek Tiger Beetle habitat at the confluence with Salt Creek, some restrictions on land use will likely be developed. Based on the Mayor's Salt Creek Tiger Beetle Cabinet Report, it is likely that open spaces (buffer zones) will be created or maintained. These areas may be used as protected habitat areas or ecological study areas. The lower portion of the segment is grazed pasture. The amount of natural riparian vegetation the upper part of this segment has been reduced through stream modification and agricultural tillage to the top of stream banks.

Threat Matrix

Issue	Degree of Threat		
	Low	Medium	High
Reach Stability			X
Flood Hazard Potential	X		
Infrastructure		X	
Water Quality	X		



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Stream Segment 13
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FIGURE: I-13P